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A Comparison of Psi and Subliminal Perception

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Summary

This programme of research is concerned with a direct comparison between the ways in which we respond to, and become aware of, subliminal and psi stimuli. I define subliminal percepts as those produced by sensory stimulation below the awareness threshold; psi "percepts", i.e. telepathy, clairvoyance and precognition, are those occurring in the absence of any physical stimulus.

Initially a preliminary investigation was run to choose suitable target stimuli and to ascertain the correct subliminal volume. Then an exploratory study was run in which 10 participants undertook six Ganzfeld sessions each. The Ganzfeld technique induces the hypnagogic state and is a successful and well-researched design in parapsychology. Besides measuring levels of awareness to the stimuli, affective, physiological and personality factors were assessed. In the follow-up study, the basic design and targets were refined, and more extensive psychological tests were included; a semantic differential test, a state of consciousness report, and cognitive flexibility tests. The final study was run in order to assess whether the basic findings would generalise to a wider segment of the population.

Results from the exploratory and follow-up studies indicate that, at the cognitive level of response, the psychological process of achieving awareness of the target

is very similar for both phenomena. The final study indicated that awareness of subliminal stimuli is possibly relatively greater under certain circumstances. All three studies indicated that both phenomena are affected by factors such as attitude and personality in a similar manner.

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Chapter 1.

INTRODUCTION

This thesis is somewhat of an odyssey in that it has taken ten years to complete.

My introduction to this field came as a third year undergraduate at University College, London, when Professor Norman Dixon very kindly undertook to supervise my final year project into a comparison between psi and subliminal perception. I remember little of it other than that the participant was required to state which of two symbols I was looking at, with a session length of 25 trials. They then undertook a subliminal test using the Galvanic Skin Response and a cognitive test using Witkin's Rod and Frame Test (Witkin et al, 1962). The present series of research stems directly from that project.

In this thesis I define subliminal perception (s. p.) as being those percepts produced by sensory stimulation below the awareness threshold. Psi percepts, i.e. telepathy, clairvoyance and precognition, sometimes known as E.S.P., are those percepts occurring in the absence of any physical stimulus, yet bearing a direct relationship to a distant target.

In the first chapter I review the research literature of both s.p. and psi phenomena in order to identify those areas of similarity between the two. I also mention theoretical viewpoints, and finally examine in

detail other experiments comparing and contrasting the two phenomena. This chapter is an expanded version of the paper published in the Journal of the Society of Psychical Research (Roney - Dougal, 1986b).

The second chapter leads out of the first, defining the aims and objectives of the experiments described in this thesis.

The third chapter describes a preliminary experiment run in order to find suitable stimuli for the later experiments. It was also intended to help gain experience at running full-scale complex experiments, and was a preliminary run in a semi-Ganzfeld situation.

The fourth, fifth and sixth chapters describe the three Ganzfeld experiments in which I compare responses to psi with responses to subliminal percepts at three major levels of response: cognitive, emotional and physiological. The fourth chapter is an expanded version of papers previously presented at the Parapsychological Association Conference in 1978 (Roney-Dougal, 1979a) and at the Society for Psychical Research Conference in 1979 (Roney-Dougal, 1979b). The fifth chapter is an expanded version of papers presented at the Parapsychological Association Conference in 1981 (Roney-Dougal, 1982a), at the Society for Psychical Research Conference in 1981 (Roney-Dougal, 1981a), and at the Parascience Conference in 1981 (Roney-Dougal, 1981b). Both these chapters have been condensed into a single paper

for publication by the Journal of the American Society for Psychical Research (Roney - Dougal, 1987). The sixth chapter has been presented at the Society for Psychical Research Conference in 1986 (Roney - Dougal, 1986a).

The seventh chapter describes the results of the reported changes in mood experienced during the sessions, changes in state of consciousness, results from the word association test, and from the semantic differential performed on the target words and session images.

The thesis is concerned with a direct comparison between these two phenomena using a technique which permits ideational thinking. I worked in great depth with a small number of participants, examining the comparison between the two phenomena from cognitive, psychological, and physiological perspectives. Three major, and one minor, experiments were run. These lasted in all a period of three years, and some of the participants worked with me on all four experiments. Besides the usual test for awareness of the target stimulus, I examined shift in mood over the session, galvanic skinresponse to the stimulus, attitude, openness to experience, cognitive flexibility, imagery ability, state of consciousness, level of "field dependence", and the semantic differential of target, image and associate words. Thus I tested the participants on many different parameters, so building up a global picture.

Chapter 2.

A REVIEW OF THE LITERATURE

The similarity between the ways in which we can, under certain circumstances become aware of, and be affected by, psi and subliminal percepts has often been remarked on and written about in some detail, e.g., Beloff (1974), Dixon (1979 & 1983), Irwin (1979), Roney - Dougal (1981c) and Rao & Rao (1982).

1. The Theoretical View

1.1. The Subliminal Self.

Myers (1903) was the first parapsychologist to conceive of the idea of a "subliminal self". He remarks that psi: "requires that we postulate a "subliminal or ultra-marginal consciousness". In addition to our conscious or "empirical self" there exists a more comprehensive consciousness, a profound faculty, which for the most part remains potential and I conceive also that no self of which we have cognisance is in reality more than a fragment of a larger self - revealed in a fashion at once shifting and limited through an organism not so framed as to afford its full manifestation." (Myers, 1903).

Rao (1978) discusses Myers' conceptions and considers that he saw subliminal mentation in such states as dreams, hypnotic and dissociated states, and in creativity and genius, as subserving our conscious stream of thought. Subliminal mentation is "an inward extension of our being

cut off from common consciousness by a screen or diaphragm not absolutely impervious but liable to leakage and to occasional rupture." (Rao, 1978). As Kahn (1976) says: "Here the emphasis is on a constantly impinging heteropsychic set of stimuli which may occasionally break through, but which ordinarily press on the stream of thought in such a way as to steadily distort, modify, emphasise and deflect the ongoing processes of consciousness. Here the occasional breakthrough is less important than the constant interaction between the psi level and the stream of consciousness itself which now becomes the focus of our attention."

Rosalind Heywood, who was a distinguished psychic and wrote several books about her experiences, corroborates these views: "The process seems to be that an extrasensory signal is received at a subconscious level of the personality, and that sometimes, though not always, an overt reaction to it then occurs or an impression emerges to surface consciousness . . . This emergence does not seem to be an easy or straightforward affair." (Heywood, 1964). The impressions may be visual, auditory, symbolic or totally imageless - just a feeling.

Tabori (1968) approaches this area from a more psychoanalytic viewpoint, but with the same overall conclusions: "It is also generally accepted that our real psychical (or psychological) life functions in this subconscious. Consciousness is divided from it by a

"threshold" and has been repeatedly and aptly compared to a searchlight. It always illuminates only a certain sector of ideas or perceptions - those upon which our attention is concentrated . . . Psychoanalysis has shown that we store numerous impressions in our subconscious which have never penetrated into the full light of the conscious but have immediately sunk under its threshold. These emerge repeatedly in dreams, under hypnosis and in trance It seems that our subconscious memory retains all experience with complete faithfulness to the end of our lives."

1.2. Filter Theory

Coupled with this theory concerning the subconscious is the realisation for the necessity for only a small portion of all the possible stimuli to be consciously perceived. If we were aware of everything at once we would be overwhelmed - and go mad!

Bergson (1911 & 1921) and Broadbent (1958) have both proposed a "filter theory" whereby signals that do not achieve a necessary level of importance are filtered out, though not necessarily lost completely.

Many psychics have also remarked on this "filter", though in rather a different way, as Rosalind Heywood exemplifies in this next extract: "Better experiences than I have told me that they feel the need for self-defence very acutely. They have had to teach themselves to cut off a

kind of ESP which caused them to participate in the thoughts and moods of other people, because they could not endure it." (Heywood, 1964). Price (1949) also recognised this requirement of the mind to develop strong defences against a constant conscious awareness of psi information: "Otherwise the thoughts and emotions of all minds would be constantly received by everyone, and life would very likely become chaos, and action impossible . . . How the repressive mechanism (a screening agent) can also serve as a selecting agent needs to be explained." (Rao, 1978).

1.3. A Two-Stage Process.

It is possible that the needed explanation - that of a "selecting agent" - will be forthcoming from research into subliminal perception, which also has to explain this process. As Rao (1978) points out: "The recognition that psi usually operates at the level of the unconscious raises the possibility that an understanding of the dynamics of the unconscious may give us insights into the way psi manifests in our consciousness." Freud (1955) also considered that telepathy may be governed by the same laws that govern the subconscious sphere. He contended that a telepathic stimulus reaching a sleeper would be treated in a dream like any other external stimulus. The means by which the unconsciously received psi cognitions are externalised in consciousness are called by Tyrrell (1946) the "mediating

vehicles". These vehicles include dreams, sensory hallucinations, automatic writing, mental images and strong emotions. Tyrrell attaches great significance to this process of mediation, and suggested the hypothesis that awareness of a psychic stimulus is a two-stage process.

In this model, information is acquired through unknown means in the first stage of the process. This information then emerges in consciousness, or affects behaviour, in a manner very similar to more familiar psychological processes during the second stage. In any comparison between psi and subliminal perception it is this second stage of the process that researchers are investigating, since subliminal perception is an example "par excellence" of the various ways in which conscious thought and behaviour is affected by stimuli outside of conscious awareness.

L.E. Rhine (1962) was greatly influenced by Tyrrell's theories and also subscribed to a two-stage process for psi within her studies of spontaneous cases. She felt that psi information was apprehended within the subconscious, and that the incompletenesses, distortions, and imperfections in overt psi responses are traceable to known psychodynamic factors.

Stanford's (1974a) Psi-Mediated Instrumental Response (PMIR) theory has as its central premise that psi is employed to monitor the environment for need-relevant

information, with the consequent facilitation of those responses related to fulfillment of this need. The mediation of psi information by the subconscious is central to this theory. As Stanford states: "The emphasis on the non-intentional character of psi scanning reiterates the assumptions that psi is somewhat similar to our autonomic activity, in that it functions without our conscious intent and that the extrasensory information received at the level of the unconscious requires a mediating instrument if it is to be manifest in consciousness." (Stanford, 1974a). Basically, what Stanford is proposing is that psi may affect our actions, behaviour, thoughts, etc., in much the same way as do other unconscious dynamic factors within our life experience. As Eisenbud (1970) has phrased it, psi is a "thorough-going part of the total behaviour of the individual."

A comparison of research findings in subliminal perception and parapsychology, can help to elucidate this theory which I have so briefly outlined, since it will throw into relief the similarities and the differences between the two phenomena. There are four major aspects of psychological functioning through which these comparisons can be made: cognition, psychophysiology, personality, and emotion.

2. Comparison of Psi and Subliminal Perception from the Cognitive Aspect.

2.1. Subliminal Perception

Dixon (1971), Somekh and Wilding (1973), Henley and Dixon (1974), Henley (1975 & 1976), Andersson et al (1970), Smith & Danielsson (1977), and Mackay (1973) are just a few of the experimenters who have demonstrated that subliminal visual and auditory stimuli can influence the way in which a concurrent supraliminal stimulus is perceived.

For example, Somekh and Wilding (1973) replicated an experiment by Smith, Spence and Klein (1959) in which a neutral face was presented subliminally concurrently with a subliminal word, either HAPPY or SAD. The face was presented tachistoscopically to one eye and the word to the other. Descriptions of the face were found to be significantly more pleasant when the concurrent subliminal stimulus was HAPPY. When the cue words were replaced by HARRY and SAP, they had no effect upon perception of the neutral face when presented subliminally, but were misread as HAPPY and SAD when presented supraliminally. This experiment has two main conclusions. The first is the clear confirmation of previous findings that a conscious percept is interpreted within the context of a simultaneous subliminal stimulus. The second is that the distorting effects of expectation and restructuring which characterise conscious perception do not operate at

the subliminal level.

Henley (1975) showed that subliminal effects on conscious percepts are cross-modal, i.e., she showed that the consciously perceived appearance of a visually perceived face can be affected by the presentation of auditory cue words. Meanwhile Andersson et al (1970) and Smith and Danielsson (1977), using the Meta-Contrast Technique, showed that the conscious percept of a stimulus may be distorted in various ways by a preceding stimulus which the second, consciously perceived stimulus, masks.

2.2. Psi Perception

There are some parapsychological findings which are remarkably analogous to these experiments in subliminal perception. For example, Kreidler and Kreidler (1972 & 1973) found overall evidence, significant at the 5% level, that letters at threshold projection levels were identified more frequently when an agent in another room was perceiving the same letters at a supraliminal level, than when there was only the subliminal stimulus. The success rates were 41% with agent and 37% without. This experiment was replicated by Lübke and Rohr (1975) who obtained a difference between the conditions significant at $p = .04$. The Kreidlers' research has been criticised by Child (1977 & 1978) who considers that many of their results could be a statistical regression artifact. However, the findings

noted above he accepts as valid, and these are the pertinent findings in this comparison.

Kreitler and Kreitler (1972 & 1973) also found that subjects' responses to TAT cards were affected by an agent in a distant room consciously concentrating on a specific interpretation of the card. This experiment parallels that by Zuckerman (1960) who presented a subliminal message with TAT cards, such as "Write more", and found a significant effect on the response.

Thus, both subliminal and psi "stimuli" appear to influence other ongoing percepts and behaviour. A development of this research into the effect of subliminal stimuli on conscious percepts is that of the Defense Mechanism Test (DMT), developed by Kragh (1962). I shall describe this fully in Section 3.4.

2.3. Hemispheric Differences

In an experiment by Henley and Dixon (1974), the subliminal stimuli (words) only affected the conscious percepts when presented to the left hemisphere, the supraliminal material (music) being presented to the right hemisphere. The subjects reported any imagery that was evoked by the music, and they found that subliminal cue words, such as "water", evoked water related imagery, etc. This experiment was replicated by Mykel and Daves (1979).

Sackheim, Packer and Gur (1977) found that a relaxed state favoured subliminal determination of a neutral face, as in the Somekh and Wilding (1973) experiment described above, but only with "right-hemisphericity" subjects. They define right-hemisphericity "as the tendency of a person to habitually activate the right hemisphere, regardless of the appropriateness of that hemisphere for the task". Conceptually similar to this finding is the research by Allison (1963) in which subjects who were encouraged to think globally, intuitively, and freely, exhibited subliminal effects, but when they were encouraged to think in analytical, logical and organised modes did not exhibit subliminal effects. Murch (1969) obtained similar results, and Marcel (1978) and Marcel and Patterson (1978) found that pattern-masked words that are of "high imageability" are reported significantly more correctly when the highly imageable words are presented to the right hemisphere.

This research in subliminal perception on the differential effects of the hemispheres is still only in its preliminary stages, but there is an increasing body of evidence that the right non-dominant hemisphere plays a significant part in subliminal perception (Dixon, 1981, pp. 210 - 215).

2.3.1. Parapsychological Research into "Hemisphericity"

There have been similar speculations with regard to the "processing" of psi perceptions by parapsychologists, (e.g. Broughton, 1975; Ehrenwald, 1984). Braud and Braud (1975) and Andrew (1975) both found a differential effect depending on whether the right or the left hemisphere had been facilitated, in the direction of above chance scoring for the right hemisphere groups, and chance or below chance scoring for the left hemisphere groups. Broughton (1976) obtained significant scoring by the left hand when the subject was "engaging" the left hemisphere by reading a book. Kobayashi, Terry and Thompson (1979) report significantly greater levels of activity, as measured by percent time alpha levels in the EEG record, in the right hemisphere in a psi group during the task period. The non-psi group had a significant effect in the opposite direction with greater activity in the left hemisphere.

However, it must be noted that all these findings are still very uncertain and inconclusive, owing in part to our as yet slight understanding of the roles of the two hemispheres, and in part to the technical difficulties inherent in such research.

2.4. Verbal Behaviour

2.4.1. Subliminal Perception.

In research into subliminal perception, "words or pictures too brief or too weak to enter conscious experience have been found to influence verbal "guessing" behaviour" (Dixon, 1979). This effect has been found by many researchers, e.g. Dixon, 1956, 1958a & 1971; Gordon, 1967; and Spence and Holland, 1962. A more recent example is the research by Windahl (1978) who used a double-blind matching paradigm. He found a significant relationship between pre-sleep 10msec. exposure to a pictorial stimulus and subsequent reports of symbolically related dreams by psychiatric patients.

Perhaps more interesting for a comparison with parapsychological findings, however, is an early experiment by Dixon (1958a). In this experiment subjects were asked to say "the first word that comes to mind" every time a small spot of light appeared on a screen in front of them. Unknown to the subjects each supraliminal signal to respond was preceded by a two-second presentation of a subliminal word projected onto the screen. Galvanic skin responses (GSRs) were measured during each stimulus presentation. Dixon found that subjects were able to match their verbal responses to the spot of light with the subliminal stimulus that preceded it when, a week later, they were given a list of the stimuli and their responses. Further, the GSRs recorded during each

subliminal presentation were significantly higher for emotional than they were for neutral words. And finally, an examination of the verbal responses suggested these to be symbolic and semantic associations to the stimulus. In Dixon's words: "There is a decidedly Freudian flavour about many of the stimulus response "connections" which the subject is making". (Dixon, 1971). The methodology and results of this experiment are so similar to most free-response experiments in parapsychology as to be quite uncanny.

All experimenters in subliminal perception who have investigated verbal behaviour have noted that responses to stimuli are associates which are semantically and symbolically related. The verbal responses appear to be governed by emotional rather than logical considerations, and the range of associates given are far wider than those obtained when the same stimuli are presented supraliminally.

An excellent example of this is the Poetzl effect (1917) in which subjects are briefly exposed to a pictorial stimulus and are then required to make a drawn representation of this stimulus. Later the subject is required to report subsequent dreams (Fisher, 1954; Shevrin & Luborsky, 1958), or engages in fantasy drawings (Giddan, 1967), or in imaging (Allers & Teler, 1924; Luborsky & Shevrin, 1956; Fiss, Goldberg & Klein, 1963), or in subsequent word associations (Allers & Teler, 1924; Shevrin

& Fisher, 1967; Shevrin & Fritzler, 1968a). In all these cases, previously unreported aspects of the stimulus emerge, suggesting that they were perceived subliminally and that these different methods permit access to this subconscious material. This body of research shows the closest similarity to certain parapsychological findings of all the research into subliminal perception effects.

2.4.2. Parapsychological Research

By far the greatest body of parapsychological research has been devoted to this method of obtaining information about psi perception through subsequent verbal response.

In forced-choice experiments (e.g. Rhine, 1934, 1937, 1965; Pratt & Woodruff, 1939), from which statistically significant results have been obtained so frequently by so many different experimenters that it is impossible to mention them all here, a set number of verbal responses are permitted, and the subjects have to choose between these when attempting to "guess" the target.

This method has also been used on occasion for subliminal research. Miller (1939, 1940) used the classical ESP cards (Zener cards) projected at subliminal intensities on a translucent screen. Both naïve subjects, who believed they were taking part in a psi experiment, and sophisticated subjects, who knew that it was a subliminal perception

experiment, guessed the targets significantly correctly.

In free-response experiments, where the response "ensemble" is unlimited, as in Dixon's 1958 experiment reported above, subjects tend to respond with semantic and symbolic associates to the target, and are frequently able to match their responses significantly correctly with the target. Research using this free-response methodology has found that target related responses are reported in dreams (Ullman, Krippner & Vaughan, 1973), under hypnosis (see Schechter, 1984, for a review of 25 experiments), whilst awake and relaxed (e.g. Braud & Braud, 1973, 1974; Stanford & Mayer, 1974), and under Ganzfeld conditions (see Honorton, 1978, for a review of this vast body of research). In all these cases responses to the stimuli appear to show the same characteristics as are found in the Poetzl Effect, and as reported in the Dixon 1958 experiment.

2.5. States of Consciousness

2.5.1. Subliminal Perception

Both the free-response methodologies briefly mentioned above, and such techniques as the Poetzl Effect, utilise what are now called "altered states of consciousness". Discussions in both sets of literature as to the efficacy of such states, for enabling awareness of information that is outside of conscious awareness to be obtained, appear to parallel one another in a remarkable way

For example, Dixon in his new book quotes Murch (1969): "The effect of the stimulus on the visual system appears to require . . . a certain receptiveness on the part of the subject. If the subjects respond without analysing the problems (i.e. intuitively), the incidental stimuli have a greater effect. Perhaps conscious processes are able to override the influences of the incidental stimuli" (Murch, 1969). This conclusion, that the effect of stimulation below the awareness threshold depends on a state of passive receptivity, is something encountered time and again in research on subliminal perception." (Dixon, 1981, p.52). And again: "Whether we call it "marginal", "incidental", or "subiminal", a stimulus of such weakness or brevity as not to enter consciousness can obviously only produce an effect on behaviour, provided it is not in competition with other more powerful influences." (Dixon, 1981, p.58).

Shevrin and Fisher (1967) noted that: "sleep as such may enhance recovery of subliminal stimuli, although the subliminal stimulus will elicit markedly different responses depending on the prevailing stage of sleep. These findings point to the importance of states of consciousness with respect to the processing of subliminal information." (quoted in Dixon, 1971, p.147). Shevrin and Fritzler (1968b) also note that stimulus recovery in a symbolic form is maximised under those conditions of ongoing cerebral activity that are typical of an altered state of

consciousness. They note that the effect is sensitive to a lack of relaxation and passivity on the part of the subject, and to certain parameters of the subject-experimenter relationship. In other words, the same information may be processed in different ways at different times by the same individual in different states of consciousness. This very point is one that Tart (1975) uses as the basis of his research into consciousness, particularly with regard to awareness of psi information.

Typical to these altered states of consciousness is the use of symbolic, semantic and associational responses to stimuli, rather than the direct representation typical of "normal" consciousness. Dixon (1981, p.64) notes that: "Since the stimulus by-passes the "restricting effects of awareness" the entire range of associates become potential responses . . . a verbal stimulus evokes more associates when preconscious than when present in consciousness." Further, Fonagy (1977) found that the type of association was dependent on the hemisphere to which the subliminal stimulus was presented. Those presented to the left hemisphere (primarily) evoked common secondary process associates, whilst those presented to the right hemisphere evoked symbolic representations of the object, this being typical of primary process thought. Unfortunately, however, very little research has been done on this qualitative aspect of cognition typical of different states of

consciousness, though the work by Berger (1963; see section 2.5.3.) is of interest here.

2.5.2. The Ganzfeld Technique

This technique is an excellent method for experimentally inducing a relatively controlled altered state of consciousness. It was originally used by psychologists like Bertini, Lewis and Witkin (1964), Hochberg, Triebel and Seaman (1951), Cohen (1957), Cadwallader and Cohen (1958), Witkin and Lewis (1965), and Vogel, Foulkes and Trosman (1969) for the purpose of exploring the psychological parameters of the hypnagogic state of consciousness, and related parameters such as field dependence.

In parapsychological research the Ganzfeld (German for "whole field") is normally induced by covering the eyes with halved ping-pong balls, and the ears with headphones playing white noise. The original studies used a large translucent dome covering the head. After approximately 20 minutes most people will enter a hypnagogic state, which means that they become close to sleep and experience vivid images and dream-like thoughts. During this hypnagogic period a characteristic sequence can be observed in which relatively controlled ideation (mentation) gives way to looser ideation typical of primary process thought. Visual and auditory imagery occurs which is dreamlike in quality.

Since this is normally quickly forgotten, as are dreams, it is essential to obtain continuous reports of the mentation. In fact, there is some evidence to suggest that "talking out" one's thoughts assists the process.

2.5.3. The Ganzfeld and S.P.

From what was discussed in the previous section, it is to be expected that such a technique should be conducive to recovery of subliminal stimuli, and this was found to be so by Witkin and Lewis (1965) who presented emotional or neutral films prior to Ganzfeld induction. They found a pronounced Poetzl Effect was obtained with the neutral films, but traumatic effects resulted from the emotional films. They also found that the mentation in the hypnagogic state follows a uniquely individual course, the form being dependent on the feelings evoked by the pre-sleep experience as well as on personal character.

Of interest in this section, though not a true Ganzfeld, is an experiment by Berger (1963). He used a tape with white noise on one track and a subliminal stimulus on the other, presented to the subjects' headphones. The subject fell asleep to the sound of the white noise and the subliminal stimulus, which was turned up to a supraliminal level when the subject entered REM sleep. Subsequent dream reports were recorded and on the following morning the subject listened to their dream reports and

attempted to match them with a pool of four possible targets. Feedback was given after the session, and independent judges were also required to match the dream report with the target. There was a total of 41% correct matchings which is significant at the $p = .001$ level. Judges and subjects performed equally well, and there was a tendency for both the subjects and the judges to match the same dreams to the same targets - whether correct or incorrect. There was no appreciable difference for emotional or neutral stimuli. The results from this subliminal perception experiment are identical with the dream-psi experiments run by Ullman and Krippner in the 1960's, these experiments being the methodological forerunners of the Ganzfeld research (Ullman, Krippner & Vaughan, 1973). In Ganzfeld research it is repeatedly found that an experiment will yield approximately 40% correct matchings, the chance level being 25%.

Berger also noted the type of imagery by which the stimulus was incorporated into the dream. He found four different categories:

- 1) Assonance: the majority of incorporations were in this form, e.g., Gillian - Chilean. Very similar to childrens' rhymes!
- 2) Association: e.g., stimulus word "Richard"; a dream about shops, i.e. "Richard shops".
- 3) Direct: either to the stimulus itself or the procedure.

4)Representation: some object represents the stimulus.

Of these four, Berger considered the assonant connections to be the most important, but unfortunately very little work has been done on this aspect of the process to corroborate his suggestions. From the foregoing two experiments, and since the Ganzfeld is a relaxing environment, it is quite possible that it could be a useful technique in research into subliminal perception. As noted in section 2.5.1., Dixon (1971), Allison (1963), Shevrin and Luborsky (1958) and Fisher and Paul (1959) all consider that an altered state of consciousness which permits "effortless relaxation" is the most propitious condition for subliminally registered stimuli to appear in subsequent imagery.

2.5.4. The Ganzfeld and Parapsychology

As mentioned earlier, parapsychological research has found that the hypnagogic state induced by the Ganzfeld is an excellent state by which subjects can become aware of psi targets. When Honorton (1978) reviewed all the Ganzfeld research up to then, he found that over 50% of the experiments had given significant positive results (c.f. Honorton, 1985; Hyman, 1985).

Whilst most Ganzfeld experiments differ in their details, a basic methodology has grown up over the years, and so I shall take just one of the many experiments

performed using this technique in order to exemplify it. Schmitt and Stanford (1978) report an experiment that is considered even by the critics (Hyman, 1985) to be significant after all possible sources of error have been accounted for.

They used unselected volunteers who were given a short briefing concerning the experiment. Then halved ping-pong balls were taped over the eyes and a red light was placed about 18 inches away from the face. The white noise was presented via headphones at a preset moderate volume. Each subject attempted to perceive only one pictorial target drawn from a target pool of four magazine pictures, each of which had been preselected so as to be maximally different from one another. Both target and target pool were chosen using a random number table procedure by an assistant who had no contact with the subjects.

The subject was told to report any imagery, thoughts and feelings which might occur throughout the whole experiment. Normally a Ganzfeld session lasts approximately 30 minutes. At the end of the session the subject was shown all four pictures in the target pool and asked to rank order the pictures from one to four on the basis of the mentation experienced whilst in the Ganzfeld. The subject was then given feedback by the assistant as to the correct target.

Ganzfeld studies in parapsychology echo what White (1964) calls the "old method" of psychics in which the

psychic uses a specific technique to promote awareness of the psi target, namely:

- 1)Relaxation;
- 2)Engaging the mind with a specific demand;
- 3)Waiting, tension and subsequent release of effort;
- 4)Allowing the response to enter consciousness.

Although the steps in this method are deliberate and conscious, the aim is to produce a spontaneous and unconscious response, i.e., one not initiated by the conscious mind. One of the purposes of this method is to take the guesswork out of the psi response at the conscious level. Apparently the correct response exists at a subconscious level, and by making the contents of the subconscious conscious, much of the guesswork can be eliminated. The main task confronting the conscious mind is then to recognise the correct response if and when it occurs (White, 1964, pp.27 - 28).

Use of the Ganzfeld and other methods such as Autogenic Relaxation led Braud (1975) to outline what he calls the "Psi-Conducive Syndrome". This has seven major characteristics:

- 1)Physically relaxed;
- 2)Reduced physical arousal;
- 3)Reduction in sensory input and processing;
- 4)Increased awareness of internal processes, feelings and images, including dreams and fantasy;

- 5) "Receptive mode" or "right hemisphere" functioning;
- 6) "Altered" view of the nature of the world;
- 7) Motivation - the subject must be motivated in favour of psi.

This syndrome contains many points in it which I have already discussed with regard to subliminal perception, such as the importance of relaxation and reduced physical arousal (Shevrin & Fisher, 1967); reduction in sensory input and processing (Dixon, 1981); "right-hemisphere" type functioning (Sackheim, Packer & Gur, 1977); and motivation (Miller, 1940). Since the Ganzfeld is a technique which maximises the psi-conducive syndrome, which has many points in common with suggestions for maximising subliminal perception verbal reports, it is possible that the psychological processes by which information from the two phenomena is brought into conscious awareness, follows a similar, if not the same cognitive pathways.

2.6. The Experimenter Effect

Ever since the seminal work by Rosenthal (1966) on the possible bias caused in psychological experiments by the expectations of the experimenter being transmitted to the subject through non-verbal and subconscious processes, parapsychologists have been alert to the potential problems of the experimenter effect within their experiments.

Researchers in subliminal perception have been

aware of this also. Dixon (1971) has noted that where an experimenter has failed to replicate the above effects of subliminal stimuli on verbal behaviour, either using the Poetzl technique or another, the explanation is most likely due to the relationship between the subject and the experimenter, and the experimenter's attitude. He considers that this aspect of the experiment does not necessarily invalidate the results. "On the contrary, there are good grounds for supposing it to be an essential ingredient for the recovery effect." (Dixon, 1971, p.132).

At another point he notes: "We have, after all, to explain why it is that some experimenters, some academic departments, and even some countries, invariably provide positive evidence for subliminal perception effects whilst others with almost equal monotony do not . . . One can only conclude that the crucial and deciding variable is the belief system of the experimenter concerned . . . The experimenter effect is largely non-specific, and determines the general state of receptivity of the subject, rather than the SPECIFIC information which he receives." (Dixon, 1971, p.242).

In recent years parapsychologists too have been more and more concerned with the experimenter effect, especially with regard to free-response material. An excellent review of experimenter effects in

parapsychological research is given by Kennedy and Taddonio (1976). Amongst other things they note a forgotten but very relevant point that in most experiments where undergraduates are the subjects, the experimenter is usually more involved and motivated than is the subject.

An example of an experiment performed specifically to investigate the effect of the experimenter is that by Honorton, Ramsey and Cabibbo (1975). They ran an experiment in which there were two experimenters, one warm and friendly and the other cold and aloof. *Each experimenter role-played each role half the time.* They conclude that : "The results support the hypothesis that friendly, supportive, informal experimenter-subject interactions are conducive of psi-hitting, and that unfriendly, formal interactions are conducive of psi-missing.". Parker (1975) found that he obtained a differential scoring effect when the two student experimenters were themselves primed to expect different results from their subjects. These results parallel those of several other investigators (e.g. West & Fisk, 1953) suggesting that Dixon's theorising and surmises with regard to the influence of the experimenter in subliminal perception, is in fact true also in parapsychology.

3. Comparison of Psi and Subliminal Perception from the Emotional Aspect.

According to Dixon (1981): "The emotional connotations of a subliminal or unattended stimulus have been shown to affect electrodermal responses, voluntary response latencies, visual (and auditory) sensory thresholds, components of the EEG, visual evoked responses, the Poetzl effect, retrieval from long-term memory, after-images and after-effects, dark adaptation, dreams, lexical decisions and consciously experienced affect." (p.121). I think, therefore, that one can safely say that the emotional aspects of a subliminal stimulus have wide-ranging effects. Many of these findings have occurred in research under the general rubric of "perceptual defence".

3.1. Perceptual Defence

A major aspect of perceptual defence is that subjects exhibit longer or shorter duration thresholds for tachistoscopically exposed emotive stimuli, i.e. they either raise or lower their thresholds. Those who raise their thresholds for unpleasant stimuli are said to be "defensive", whereas those who lower them are said to be "vigilant".

The Defense Mechanism Test designed by Kragh (1962)

utilises this in order to predict various behavioural characteristics of a person. The test involves many successive tachistoscopic exposures of a threatening test stimulus at gradually increasing exposures. After each exposure subjects are required to draw and comment on what they have seen. Kragh classified the responses in terms of various defense mechanisms. The predictive powers of this test have been extensively validated and it is now used as part of the standard selection procedure for applicants for flying duties in the Air Forces of Norway and Sweden. Those who exhibit a "defensive" reaction to the threatening portion of the stimuli by raising their thresholds and consciously perceiving non-threatening portions of the stimulus alone, i.e. exhibiting denial, have been found to make poor pilots with an above average chance of being involved in flying accidents, or of becoming non-operational through absenteeism or psychosomatic illness (Dixon, 1981).

Other experimenters who have explored this aspect of perceptual defence are Henley, 1974; Dixon, 1958b; Goldstein, 1962; Goldstein, Himmelfarb and Feder, 1962; Zajonc, 1962 (for a description of this experiment, see section 5.2.1.). The alteration of threshold ostensibly acts to prevent the defensive subject from experiencing negative emotions. An excellent example of these experiments is that of Dixon (1958b). In this experiment he presented a neutral stimulus (a spot of light)

to one eye, and an emotional subliminal stimulus to the other eye. The subjects' task was to keep the spot of light at exactly the same intensity as the background, so that it was neither lighter nor darker. Thus, any changes in threshold were measured both for magnitude and for direction using a neutral supraliminal stimulus. At no time was the subject aware of the emotional subliminal stimulus. Results from this study were significant at $p = .04$, the emotional subliminal stimuli significantly changing the threshold for the other eye. Further, the subjects exhibited consistency in the direction of their threshold change; they either always raised their thresholds when emotional words were presented, or always lowered them.

A second major aspect of perceptual defence is that prerecognition guesses of emotional stimuli are accompanied by significantly large Galvanic Skin Responses (GSRs). Large GSRs are also evoked by emotional subliminal words without any verbal response being asked for. So many studies have utilised this skin response measure that it is impossible to mention them all here. Good examples of this effect are found in McGinnies (1949), Dixon (1958a), Worthington (1961), Corteen and Wood (1972), Corteen and Dunn (1974), Von Wright, Anderson and Stenman (1975), Forster and Govier (1978), Lazarus and McCleary (1951), and Dulany and Eriksen (1959). These experiments are discussed also in section 5.2.

1.

In the research by Corteen and Wood (1972), subjects were presented supraliminally with words coincident with a small electric shock. In a later session subjects were asked to report prose presented to one ear. At the same time subliminal words were presented to the other ear. Whenever the shock associated word was presented subliminally the subject gave a significantly large GSR to that word. Further, not only the shock associated words, but also semantic associates of these words evoked significant GSRs. On neither occasion was the shadowing task affected. At no time was the subject aware of the presentation of the subliminal words, but there must have been a subconscious awareness for the GSR to have been evoked. In other words: "The meaning of a stimulus which does not enter awareness may nevertheless be analysed unconsciously and evoke consciously experienced feeling tone." (Dixon, 1981, p.132), i.e. sweaty hands!

3.2. Processing Pathways

The data from research into perceptual defence suggest that it involves the following stages of preconscious processing: cortical registration and analysis of the input, followed by emotional classification, leading to a cortico-reticular interaction, whereby the cortex, in setting its own level of arousal, determines the conscious threshold for awareness of the incidental stimulus (Dixon,

(1979).

Dixon arrived at this description of the process primarily as a result of his "spot of light" experiment reported above (Dixon, 1958b). It would appear that the physiological consequences of emotional arousal exercise a "gating" effect on sensory inflow, the emotional stimuli having a significant effect on the sensory aspects of the decision process (c.f. Hardy & Legge, 1968; Broadbent & Gregory, 1967; Dorfman, 1967).

However, it seems possible that there are both central and peripheral gating processes. "The central nervous system provides many opportunities for the control of sensory information. Such gating as occurs may be found at all levels from the peripheral receptor to the primary cortical receptor areas. Furthermore, these regulating mechanisms involve not only the reticular activating system, but also autonomic centres in the hypothalamus and nuclei mediating "emotive" processes in the limbic cortex." (Dixon, 1981, p.158).

(For a further discussion of the possible brain mechanisms underlying the behavioural responses to subliminal stimuli, see section 5.1.)

3.3. Psi-Missing

Perceptual defence is closely paralleled in parapsychology by the phenomenon of "psi-missing", in which

the percipient scores significantly BELOW chance. These significantly below chance psi scores indicate that the percipient "knew" at some subconscious level what the correct answer was, and avoided it for attitudinal, motivational, or emotional reasons. Nash (1979) points out that: "Psi-missing cannot be attributed to the absence of psi as that would cause chance expectancy results. Instead it results from the use of psi to unintentionally produce an extrachance negative deviation. Similarly, subception missing (perceptual defence) is not caused by an absence of subliminal perception but to the use of subliminal perception to call the targets in a direction opposite to the conscious intent."

The point that Nash makes here is that there can be no such thing as nonperception of a subliminal signal that is above the physiological threshold. This is a very important point. If the signal is physically perceptible then it is considered to be a subliminal perception until it reaches the recognition threshold when it is a conscious or supraliminal perception. The whole area between our conscious awareness and the physiological limits of our senses (which are considered by some neurologists to be sensitive to as little as one photon of light) is the domain of subliminal perception. Once the signal is outside the physical range of the senses, it is considered to be "extrasensory" or psychic. That is why such care is taken to

place the sender and receiver in separate rooms in psi experiments, since the limits of subliminal perception are not yet defined.

In the quote by Nash (1979) he considers psi-missing to be unintentional. This is a debatable point, and recent work by Tart (1984) and others on the "fear of psi" also addresses this issue. In subliminal perception the missing of the signal is considered to be a defence against consciously unwanted information. In psi, attitude also affects the scoring direction, as is evinced by the "Sheep - Goat" effect discussed in section 3.5. As Beloff (1974) points out: "The acknowledgement of perceptual defence as a genuine psychological phenomena should make it that much easier for us to accept the concept of "psi-missing" as a parapsychological phenomenon. For the point about perceptual defence is that it implies the possibility of identifying a stimulus at an unconscious level in order to PREVENT its recognition at a conscious level.

"Findings like these (perceptual defence) strike one as so bizarre, from a common sense point of view, that one may be forgiven for wondering whether ESP might not be a more straightforward explanation for the results than one in terms of subliminal perception. Actually, Dixon himself has told me that one cannot rule out this as a hypothetical possibility since few experimenters have bothered to control for an ESP effect . . . It is a nice stroke of irony that,

for once, we should be discussing ESP as a potential explanation of an alleged case of subliminal perception instead of, as so often, subliminal perception as an explanation for an alleged case of ESP." (Beloff, 1974). Beloff makes this contention because, whilst it is possible to remove sensory contamination from an experiment by, for example, separating the sender from the receiver, there is no way that one can remove "extrasensory" contamination from an experiment. One has to control for this contamination by assessing the level of psi effect within the experiment and, using this as a baseline, assess the subliminal effect as that effect over and above the baseline.

3.4. Psi-Missing Experiments

There have not been so many studies exploring the parameters of psi-missing as those studying perceptual defence, but findings indicate that attitude (Schmeidler & McConnell, 1958; Palmer, 1971, 1972, 1977), motivation (Rhine et al., 1940; White, 1977), negative emotional stimuli (Moss, 1970) and various personality defence mechanisms (Johnson, 1971; Johnson & Nordbeck, 1972; Johnson & Lubke, 1977) all have an effect on psi scoring as they do in perceptual defence.

Johnson and Haraldsson (1984) review a number of experiments since 1967 in which the DMT (discussed in section 3.1.) has been used to predict ESP scoring in a

subsequent test. Out of 10 such studies, 7 gave a statistically significant result, indicating that the way in which a person responds to the DMT will be reflected in the direction of that person's scoring on the ESP test, i.e. those who exhibit defensive responses to the subliminal stimuli tend to score below chance on the ESP test; those who show vigilance on the DMT and few signs of defence tend to score above chance on the ESP test. In other words scoring on subliminal perception tests is correlated with scoring on psi perception tests. In the Johnson (1974) experiment he obtained a $p = .05$ significant relationship between subliminal defensiveness and psi-scoring. In this report he also mentions that if a target has a very unpleasant and personal meaning for the person, then they will tend to avoid guessing that type of target correctly. In another study not directly concerned with the DMT (Johnson, 1971) he obtained data which suggested that a person who would ordinarily score above chance, could be manipulated to psi-miss by presenting a relevant choice of life-history target material.

3.5. The Sheep-Goat Effect

Perhaps most research on psi-missing within parapsychology has been done with research on the "sheep-goat" effect. Palmer (1977) gives an excellent review of research in this area.

In this effect those who state, in a questionnaire given prior to the experiment, that they do not believe in psi, or do not believe that they will be successful in exhibiting psi effects during the course of the experiment, will tend to score significantly below chance, i.e., psi-miss. Those who believe in psi and also believe that they will show psi-related effects in the experiment, tend to score above chance, i.e., psi-hit. This attitudinal variable appears to be a very important parameter and has been verified repeatedly over the past 30 years since it was first noticed by Schmeidler (1943).

The "goats" do not believe that psi effects exist. However, rather than scoring at chance levels as would be expected if their beliefs were true and there were no such phenomenon as psi, they appear to actively defend against the subconsciously perceived psi stimuli, and so produce significant psi-missing which is not a chance effect.

4. Comparison of Psi and Subliminal Perception from the Personality Aspect.

4.1. Subliminal Perception

Research into perceptual defence has indicated that there are two broad streams of response to a subliminal stimulus: defense (closed) versus vigilance (open). Not only are these response systems related to the perceptual defence studies already mentioned, but also to more general personality characteristics of importance in subliminal perception.

Related to material already discussed in sections 2.3. and 2.5.1., Gordon (1967) found that art students were significantly more open to subliminal phenomena than were science students. Shevrin and Fritzler (1968a), replicated by Shevrin, Smith and Fritzler (1969) found that those rated high on repressiveness, as measured by their Rorschach score had significantly less ideational activity to the subliminal stimulus. Fisher and Paul (1959) noticed that "the greatest effect was evinced by those with a readiness and ability to give themselves up to fantasy, to accept passivity and to enter into an empathic involvement with story characters." Fiss (1966) obtained a significant correlation between a subject's self-rating of hostility and his responses to nonsense words presented supraliminally concurrent with a subliminal stimulus of "angry". Murch (1969) noted that those

who responded intuitively showed a greater effect of the subliminal stimulus than did those who responded analytically. Sackheim, Packer and Gur (1977) write that: "Both situational and individual factors are related to the appearance and strength of subliminal effects, i.e. relaxed passivity maximises subliminal effects. Those subjects who use a global, intuitive, cognitive strategy produce greater subliminal effects than do those thinking in analytic, logical and organised modes." Allison (1963), as mentioned in section 2.3., found that when subjects were encouraged to think globally and intuitively, that subliminal effects were demonstrated.

4.2. Field Dependence

Related to these findings on the effect of various personality characteristics on the perception of subliminal stimuli, are those relating subliminal perception to the trait of field dependence as defined by Witkin et al. (1962). In the experiments mentioned in section 2.5.3., in which a film was shown prior to the Ganzfeld period (Bertini, Lewis & Witkin, 1964; Witkin & Lewis, 1965), it was found that some subjects were more affected by the Ganzfeld and by the film. Those affected were those who he defines as "field dependent" or "global" in their cognitive style. These people experienced a far greater amount of imagery, were able to report what they were experiencing,

and occasionally went into a trance-like state.

Cohen, Silverman and Schmajonian (1962) also report that field-dependent subjects are more prone to hallucinatory experiences during sensory deprivation experiments. Related to these studies is one by Foulkes (1966) in which he found that ability to recall dreams was associated with a less defensive personality structure.

In conclusion, whilst relatively little research has been done on the effect of individual personality variables on subliminal perception, it appears that the research that has been done all points to the same conclusion: those susceptible to subliminal stimuli tend to show less repressiveness, more imageability, more "passivity", greater flexibility of report and less hostility.

4.3. Parapsychological Findings

All of the above findings are well recognised by parapsychologists who have devoted a considerable amount of attention to this area.

One of the earliest experiments exploring the relationship with personality was by Smith and Humphrey (1964). They found that "expansive-secure" subjects obtained significantly more hits than did "compressive-insecure" people, as measured by Cattels 16PF questionnaire. Nicol and Humphrey (1953) obtained a significant positive relationship between self-confidence and emotional

stability and a high ESP score.

More recently Kanthamani and Rao (1972, 1973) found that high neuroticism gives a low psi score, using Eysencks Personality Inventory. They further noted that a warm, sociable trait scores higher than a critical, aloof one, and that dominant, happy-go-lucky and realistic traits correlate with positive psi-scoring, whilst submissive, serious-minded and aesthetically sensitive traits correlate with negative psi scores. Humphrey (1945), Nash (1966), and Rivers (1950) have also found a relationship between neuroticism and psi-scoring, with the general conclusion that people who are highly neurotic do not tend to score positively.

The introversion-extraversion dimension of personality has also frequently been researched by, for example, Bender (1964), Humphrey (1951), Kanthamani and Rao (1972), Schmeidler (1966), and Sargent (1980). The overall findings tend to suggest that the extravert personality tends to perform better in a laboratory situation, but only under circumstances that favour extraversion generally.

Psi scoring has also been related to trait anxiety by, for example, Schmeidler and McConnell (1958), Rao (1965), Nielsen and Freeman (1965), Siegel (1980) and Sargent (1980). The overall conclusion is that a high level of anxiety inhibits psi awareness, but once again the picture is not a simple one, since introverts do best in a

relaxed setting, whilst extraverts appear to require a more challenging setting.

In conclusion, when Palmer (1977) reviewed this area he stated that: "When experiments involving group testing are eliminated, the remaining studies reveal a highly consistent pattern in support of a negative relationship between ESP and neuroticism . . . ESP scoring tends to be highest among subjects with superior emotional adjustment, particularly as this affects their ability to adapt to social situations such as psychological experimentation." Gertrude Schmeidler (1966), in a review, notes the following personality characteristics that appear to enhance psi processes: an open attitude, physically relaxed, mutual liking between subject and experimenter, extravert, lively, responsive, not withdrawn, socially adjusted and intellectual acceptance of the task. She also notes (Schmeidler, 1975) that subjects score better with tasks and methods that they like. Since there is a need for a moderate level of arousal and anxiety, anxious subjects need a bland experiment, whilst relaxed subjects need a more arousing one.

Thus, the expression of psi is influenced by a number of personality factors working in combination. Psi appears to function as do other psychological mechanisms, with defensiveness and reserve inhibiting its expression, and an open state facilitating it.

5. Comparison of Psi and Subliminal Perception from the Physiological Aspect.

5.1. Theories and Models

"Given that the end result of subliminal perception is almost indistinguishable from ESP, namely a purely statistical effect upon the probability matrix underlying the possible repertoire of behavioural and autonomic responses, it seems reasonable to ask at which processing stage extrasensory effects begin to be felt - at the peripheral receptor, the mid-brain, thalamic relays, cortex, or reticular system? If the results of extrasensory perception are likened to those of subliminal perception, then they must involve preconscious semantic analysis, emotional coding and access to long term memory. Hence we must assume that extrasensory effects lock into the nervous system at some stage prior to those responsible for these functions, yet capable of modulating the arousal systems of the brain. Sensory relays in the mid-brain, thalamus, association cortex, or limbic system would all be possible candidates for this hypothetical mediating function." (Dixon, 1979).

Others involved in research into the subconscious also emphasise the limbic system, hypothalamus and pituitary as being the "physiological seat" of subconscious processes. For example, the model the Greens (1977) propose as a result

of their research with biofeedback, includes the following description: "The neurological location of conscious processes seem to be in the cerebral cortex and the cranio-spinal apparatus. The normal location of unconscious processes appear to be in the subcortical brain and in the autonomic nervous system. Information from limbic processes can reach consciousness and vice versa. The limbic system is an important link between emotions and the body. Emotional states are correlated with electrophysiological activity in the limbic system. It is connected to the hypothalamus - the central control panel of the autonomic nervous system including the pituitary."

With regard to psi processes, Beloff (1974) also speculates that the system which mediates psi might involve limbic and mid-brain mechanisms. There is a subliminal fringe area where the brain/body responds to a stimulus but the mind does not know of it. Dixon (1983) states that it is quite possible that 99% of the events going on in the body do not enter conscious awareness at all. For example, the muscle movements required to type out these words are not under conscious control - although I sometimes think they should be the number of mistakes I make! Having learnt the skill, my "automatic pilot" takes over and responds to the stimuli as necessary, freeing my conscious awareness for the task of thinking about the meaning I am trying to convey. Another excellent example of the extent to which we respond

to stimuli without conscious awareness is that of driving a car or riding a bicycle along some well known route. Most people have had the experience of arriving at their destination with no awareness of the actual journey, as they were deep in thought throughout. The "automatic pilot" performed the necessary and habitual task of getting them from A to B. Channel capacity is so limited that only very important information enters consciousness. If psi has any physiological basis, particularly as regards the second stage of the process which is under consideration here (see section 1.3.), then this should also be true for psi stimuli.

5.2. Experiments Utilising the Galvanic Skin Response (GSR)

As mentioned in the section on perceptual defence (section 3.1.), the most common mode of recording a physiological response, in the absence of any form of verbal or other behavioural response, in subliminal perception utilises the galvanic skin response, or electrodermal effect. There is a growing body of psi research using this technique as well.

In a galvanic skin response, the autonomic nervous system activity is monitored through the amount of sweat on the subject's hands or fingers. Sweating on the hands is not governed by body temperature, but by one's level of tension or relaxation, as anyone who has had to perform in public

knows only too well! A sympathetic nervous system response (tension/attention) results in an increase in skin conductance - more sweat; a parasympathetic nervous system response (relaxation/withdrawal) results in a decrease in skin conductance. Normally a galvanic skin response to an emotional stimulus results in a sharp and sudden increase in skin conductance.

5.2.1. Subliminal Perception and GSR

McGinnies (1949) found that emotional words presented subliminally produce a significantly greater GSR than do neutral words presented subliminally, suggesting that the meaning of the word is registered even though there is no conscious awareness of it. Dixon (1958a), (see section 2.4.1. for a full account of this experiment) also obtained significantly higher GSRs for emotional words presented subliminally than for neutral subliminal stimuli.

Zajonc (1962) also used taboo words and neutral words but this time as paired associates. In stage 1 recognition thresholds and GSRs were measured for both sets of words. In stage 2 the taboo words were paired with the neutral words and the subjects had to learn these pairs. In stage 3 each word was again presented and the subject had to respond with the associate when recognition threshold was reached. In both stage 1 and stage 3 larger GSRs occurred, with the taboo words as stimuli, even though in stage 3

conscious response was a neutral word. However, it should be noted here that, when a stimulus approaches the recognition threshold, the stimulus effect is gradually replaced by a response effect, and so, CLOSE TO THE THRESHOLD ANY RESPONSE CONFLICT WILL OVERRIDE ANY PERCEPTUAL EFFECT. It is important to keep this point in mind because a number of parapsychologists who have compared subliminal perception with psi have in fact used stimuli close to the recognition threshold, and so have not been obtaining true subliminal effects in their comparisons.

Other techniques that have utilised the GSR are those already mentioned under perceptual defence, in which shock associated words presented to the "unattended" ear during dichotic listening tasks evoked significant GSRs; e.g. Corteen and Wood (1972), Corteen and Dunn, (1974), Von Wright, Anderson and Stenman (1975), and Forster and Govier (1978). In a similar type of experiment, Lazarus and McCleary (1951) presented nonsense syllables some of which had previously been associated with electric shocks. These subliminal shock-associated nonsense syllables produced significant GSRs, suggesting that physiological responses to subliminal stimuli are wider than purely semantically related responses.

In fact, we seem to be capable of an enormous range of unconscious sensory perception. A recent experiment in Russia, reported by Dixon (1983), used two balloons inserted

into the duodenum. When the first balloon was pumped up there was a corresponding physiological response which then habituated. On pumping up the second balloon the physiological response was obtained once more. If the subject was given feedback about this response they could, after a while, begin to consciously feel the balloon.

5.2.2. Parapsychology and Physiology

In a series of experiments that closely resemble the research by McGinnies (1949), Douglas Dean (1962, 1966, 1968, 1969; Dean & Nash, 1967) found that emotional words (personal names of close friends and relations of the subject) concentrated on by a sender, produced a significant plethysmograph effect in the subject. A plethysmograph measures blood flow to the hand and this is an autonomic response functionally equivalent to the GSR. This finding was replicated by Esser et al (1967).

In a psi experiment, similar to that of Lazarus and McCleary (1951), Woodruff and Dale (1952) conditioned subjects to associate certain symbols with electric shocks. They found that subjects who exhibited the greatest amount of GSR activity also had the highest number of correct guesses for which symbol was being presented, although this latter finding was not significantly above chance. Braud (1981) in his review of the literature, suggests that this absence of a significant psi effect might be attributable to

the negative effect induced by the use of electric shocks. In a similar sort of link up between verbal report and physiological response, Tart (1963) gave random shocks to the agent whilst measuring GSR, EEG and plethysmograph responses from the receiver. He found that both GSR and plethysmograph were lower on the shock trials (i.e. overall increased sympathetic activity), and concluded that the results suggested that the subjects were responding physiologically to some form of transmission from the agent. As in the Woodruff and Dale (1952) study, the subjects' conscious guesses, as to which trials were the shock associated ones, did not differ significantly from chance, so we have once again an example of a physiological response to a stimulus with no concomitant cognitive response. Hettinger (1952) also reports that percipients exhibited increased GSR activity when agents located at distances ranging from 5 - 200 miles were stimulated by whistles, loud noises and physical exercises.

Davis and Braud (1980) measured subjects' GSRs whilst they viewed a series of neutral targets one of which was the psi stimulus being concentrated on by the agent. They obtained a significantly greater physiological response to the stimulus which was the psi target, even though verbal guesses as to the psi target were not significantly correct. They conclude that: "The data at least suggest that GSR responses can serve as indicators of

psi, perhaps being more accurate than verbal responses." (Davis & Braud, 1980).

Two experiments in which the agent rather than the subject was stimulated are those by Schouten (1976) and Kelly, Varvoglis and Keane (1979). In both cases there was a significant GSR by the subject (receiver). As with the series by Dean (see above), emotional stimuli were used.

Otani (1955, 1958 & 1965) found that hits on a clairvoyant target increased proportional to the degree of relaxation of the subject, as measured by their basal skin resistance. However, there is a maximum relaxation level of 15 kohm, and any higher level of skin resistance is associated with a lowering of psi scoring. Stanford, Angelini and Raphael (1985), and also Braud (1981), noticed that there appears to be an optimal level of relaxation for successful psi scoring. This point was also briefly touched upon in section 4.3. with regard to the anxiety/arousal levels of introverts and extraverts. In Stanford's words: "There is considerable evidence in the parapsychological literature that there is an optimal level of arousal for ESP performance - though that level may depend on the type of ESP task being used - and that this level is low, but not extremely low, representing something like a relaxed alertness." (Stanford, Angelini & Raphael, 1985). I consider, from my research, that very high basal levels of skin resistance represent a withdrawal from the situation,

and it is this withdrawal that is not conducive to awareness of the psi target.

In conclusion, a central premise of subliminal perception is that, even though the signal is not consciously discriminated, an autonomic response can be measured, particularly with emotive stimuli. Overall the findings from parapsychology parallel this, and also appear to support Stanford's (1974a) PMIR theory of psi, mentioned in section 1.3.

5.3. The Subliminal - Psi Interface

An interesting facet of subliminal perception is that subliminal effects appear to be negatively correlated with stimulus energy. The further below threshold, the weaker or briefer the stimulus, the stronger its subliminal effects. For an example of this I shall review the work of Zenhausern and colleagues who ran a series of experiments comparing subliminal and supraliminal accessory stimulation. They were interested in research that has indicated that the receptiveness of one modality, e.g., the visual, can be influenced by the accompanying stimulation of another modality.

Subliminal white noise was found to affect visual functioning by DeLungo and Zwosta (1966). They found that the subliminal level of accessory auditory stimulation (white noise) had a greater effect on the perception of a

visual illusion than did supraliminal white noise.

In a second experiment, Zwosta and Zenhausern (1969) used white noise as an accessory stimulation ranging from 15dB below threshold to 15dB above threshold. The subjects had to indicate the presence of a visual stimulus that was set at the 50% correct detection point, i.e., at the recognition threshold. They analysed the results using signal detection theory techniques, and found that the subjects' sensitivity to the visual stimulus was greatest when the noise was at its maximum subliminality (-15dB) and at its maximum supraliminality (+15dB), with least sensitivity when the white noise was at +10dB.

In 1973, Zenhausern, Ciaolo and Pompo used accessory white noise with the Ames visual illusion, the subject having to report every time the target changed direction. Once again the mean number of illusory experiences across seven noise levels showed that the -30dB, i.e., the most subliminal level, was related to the greatest number of illusory experiences. Over 35% of the subjects reported the largest number of illusory experiences under this condition.

Eagle (1959), Paul and Fisher (1959) and Spence and Holland (1962) all report that subjects with high recognition thresholds show a maximal effect from subliminal stimuli, suggesting conceptual corroboration with Zenhausern, that the more subliminal the stimulus the

greater its effect on a concomitant response - the actual effect being dependent on the stimulus and the circumstances. Zenhausern and Hansen (1974) found that subliminal white noise had an inhibitory effect on the Stencil Design Test which is a problem solving task, suggesting that: "The effect of accessory stimulation is not unitary; i.e., not only is the LEVEL of accessory stimulation an important parameter, but its effect seems to depend on the specific task-component involved."

What happens though when the subliminal stimulus becomes so weak that there is no physical effect at all, i.e., it turns into a psi stimulus? Is there a point of interface between the two phenomena? In order to discover this, we need to find reliable differences between the two phenomena, which might help us to pinpoint also the point of entry into the psychological processing mechanisms of the brain. Is there a bottom level of subliminal perception? Or do we at some low level perceive everything in our environment all the time?

Walker (1975, 1978) presented a red field to one eye and a green field to the other in a classical binocular rivalry design so that the subject saw alternate fields of red or green. But, whilst one of these fields was dominant, a subliminal stimulus was presented to the non-dominant eye. This caused the non-dominant field to become dominant. The importance of these experiments is that: "What we are

consciously perceiving is determined not by the thing that is already in consciousness but by the thing that hasn't been in consciousness before." (Dixon, 1983).

If psi involves the brain mechanisms, then we must be doing this sort of brain discrimination with psi stimuli in order to reproduce the sort of results that are obtained in psi experiments. The big difference between psi and subliminal perception is that the latter has a known physiological channel between the stimulus and the response, and we do not know of any channel for psi stimuli. It seems possible however, that there is a common pathway at the second stage of the process, since equivalent response systems appear to be used.

6. Experiments which Directly Compare Psi and Subliminal Perception.

6.1. Introduction

One of the central aspects of Dixon's thesis (1971, 1981) on subliminal perception is that subliminal perception is not just a weak form of ordinary perception, but differs radically from it on many parameters. That the form taken by subliminal perception is more akin to that taken by psi is rather amusingly demonstrated in a very early experiment by J.G. Miller (1940) in which he pretended that the task was one of telepathy, and asked the subjects to gaze into a mirror as if they were gazing into a crystal ball, and try to imagine certain geometric figures that he would try to transmit to them. In reality he projected subliminal figures and the subjects scored well above chance expectancy, but none of them realised that it was a subliminal perception experiment, and all of them were surprised to learn that it was not a genuine test of telepathy! Thus, we can say that subjectively there is no difference between ESP guesswork and subliminal guesswork.

Jule Eisenbud (1965) reversed this strategy, presenting psi targets in the guise of a subliminal perception experiment. He presented, at threshold level, numerals 2,3, or 4 in a tachistoscope and the subject had to state which numeral had been presented. On critical runs an

amalgam of all three numerals was presented on every trial whilst an agent was watching a series composed of the numerals on a screen at supraliminal durations. The subjects scored above chance only on the subliminal trials, and non-significantly above chance on the psi trials. Eisenbud attributed this partially to the low number of trials, since forced-choice techniques tend to require a large number of trials for statistical significance, and partially to the statistically significant below chance scoring of the "goats" which lowered the overall scoring rate. He obtained a significant effect of attitude for both the psi and subliminal trials, those not believing in psi scoring below chance expectancy, whilst those who did believe in psi scored above chance. There was also a significant positive correlation between the psi and subliminal scores of $r = +0.382$, in that those who scored positively with the subliminal targets also did so with the psi targets, and those who scored below chance with one scored lower with the other. Stanford (1974b) considers that these results indicate the presence of psi effects in the experiment. Significant below chance scoring is not a result of the absence of psi as this produces CHANCE scoring. Psi-missing is equivalent to perceptual defence as the significant correlation between the two phenomena corroborates.

6.2. Early Research

One of the first experiments to compare psi with subliminal perception was that by Coover (1917). A reanalysis of his work using more modern statistical techniques by Rhine (1934) indicated that he had obtained above chance scoring on both psi and subliminal targets, although at the time he considered that he had obtained chance results.

Williams (1938) in a tachistoscopic experiment on subliminal targets utilised a control period of zero illumination, which is in effect a psi condition. He obtained significant results only for the subliminal targets. This is the only subliminal perception experiment I know of which includes such a control!

Woodruff and Murphy (1943), in an investigation of the role of motivational factors, obtained positive scoring with both types of target. They obtained better psi results when there was a monetary reward, the subliminal results not differing between reward and non-reward conditions.

6.3. Forced-choice Experiments

Using a forced-choice Zener card technique, Nash and Nash (1963) presented subjects either with subliminal targets or with psi targets, which were blank slides, the name of the target being written on the slide mounting. Thus, this was a clairvoyance test, unlike Eisenbud's which

utilised an agent. However, like Eisenbud's the subliminal targets were projected for .01 seconds which means that they were close to the recognition threshold rather than being truly subliminal. Nash and Nash obtained overall significant results for the subliminal targets, but overall non-significant results for the psi targets since there was a strong decline effect. The first psi run gave a significantly positive score of $p = .03$, whilst the second psi run gave a significance value of $p = .2$. The difference between these is significant ($p = .01$), suggesting that various motivational factors well known in such forced-choice studies had affected the psi scores, but not so strongly the subliminal which showed only a small non-significant decline effect between the first and second run. It is possibly of importance to note that the subjects were not informed that psi as well as subliminal perception was being tested, which could well have created a set in favour of the s.p. stimuli.

Kelly, Kanthamani, Child and Young (1975) examined a subject's performance on an ESP task with ordinary playing cards, together with an equivalent subliminal task with the same set of targets. Unfortunately, recognition threshold levels were used. Confusion matrices were tabulated from the set of erroneous responses under each condition, i.e. for each stimulus card the frequency of each incorrect response was recorded in one table for the subliminal condition, and

in another for the psi condition. They found a strong resemblance between the two confusion matrices, which once again indicates that the cognitive parameters of psi and subliminal processing are equivalent. The resemblance between confusion matrices was more pronounced in high scoring runs.

Haight, Morrison and Kennedy (1977) obtained a non-significant ($p = .07$) positive correlation between subjects' performance on a binary subliminal task and an equivalent psi task. Strangely, in this experiment they obtained significant psi scoring and non-significant subliminal scoring!! Even subliminal perception can become an elusive phenomenon as is so often remarked of psi. It seems a shame though that equivalent, rather than identical, tasks were set for the two phenomena, as this lessens any potential comparisons.

C.B.Nash (1979) reported an experiment in which he looked to see if various typical psi effects would also be found with subliminal stimuli. He utilised a typical forced-choice methodology, the subjects guessing how many circles were presented on each trial. He found that there was a greater tendency to miss the number of circles by one circle than to call it correctly - the displacement effect noticed by Rhine and the other early parapsychologists who used the Zener card guessing technique. He also noted the presence of four other effects that had been previously

found in Zener card research, namely "equality of deviation in high and low aim, terminal salience, unconscious target avoidance, and absence of hit clustering" (Nash, 1979).

6.3.1. The Kreitlers' Research

In a series of experiments that are conceptually rather different from the ones so far discussed, Kreitler and Kreitler (1972) studied the effect of a psi stimulus on a concurrent subliminal stimulus (see section 2.2.). They exposed targets at a threshold level, i.e. that level at which the target was reported correctly 50% of the time. They found that these semi-subliminal targets were identified significantly more correctly when an agent was concentrating on an identical supraliminal target. The effect was small and cumulative and the psi influence strongest when the subliminal target was definitely below threshold and when the response bias was low in frequency or probability of occurrence. Child (1977, 1978) has criticised the latter aspect of these findings contending that it is a regression artefact, but the main finding that a psi stimulus can affect the perception of a subliminal stimulus stands. Further, there is some support for the latter two proposals. Stanford (1973) proposed a response bias hypothesis in which he states that those responses which are low in frequency or probability of occurrence are the ones most likely to be affected by psi. There is some support for

this hypothesis, e.g. Sargent (1978). As we shall see later Munson (1980) has also come across the effect that the lower the subliminality of the stimulus the more a psi stimulus will be related to a noticeable behavioural response.

The Kreitlers also found that a psi agent could influence responses to the perceived motion of light in the auto-kinetic effect. It has often been shown in subliminal perception that a subliminal stimulus to TAT cards can affect the responses to these cards. Kreitler and Kreitler found the same effect with psi stimuli.

In 1973 they repeated the experiments using the Müller-Lyer and Delboeuf illusions as stimuli, part of each of which was supraliminal, the illusion creating aspects being subliminal. The agent had short or long lines, small or large circles, projected at supraliminal levels and attempted to influence the direction of the illusion perceived subliminally by the subject. In this experiment they found a "pronounced effect of ESP messages on the (SP) responses when the ESP messages contradict subliminal stimuli and the sender is transmitting rather than thinking." (Kreitler & Kreitler, 1973).

These results, if they are not artifactual, give an indication that the information channel utilised by psi is closely linked to that utilised by subliminal information; the psi information can, under appropriate circumstances, affect other ongoing low level perceptions before such

information affects ongoing behaviour. The Kreitlers concluded that their findings: "seem to suggest that psi information is sufficiently important to command continuous low-level attention on the part of the individual, which may turn into full-blown attention when the not-so-rare shift to the ESP channel is undertaken." (Kreitler & Kreitler, 1973).

Their work was replicated by Lübke and Rohr (1975) who used slides of letters as targets, with slides of landscapes as a control condition. There was a significant difference between the two conditions, the subjects recognising significantly more letters in the experimental condition.

6.3.2. Research at FRNM

In the laboratory set up by Rhine (Foundation for Research into the Nature of Man) there has recently been a series of experiments comparing subliminal and psi phenomena.

Rao and Puri (1978) presented a series of 60 slides at a threshold level of 30% correct determination. Half of these slides were blank, and for this half there was a psi target as in the Nash and Nash (1963) experiment. These slides were presented to the subjects both before and after the subjects had practised transcendental meditation for a week. After meditation the subliminal scores were increased relative to the premeditation scores, and the psi

scores decreased, but not significantly so. There was a significant correlation ($r = 0.385$, $p = .05$) between the subliminal and psi scores, such that the lower one's subliminal score, the higher one's psi score, which is a very unusual correlation to have obtained.

A major criticism of this experiment is that the subjects had done only one week of TM, so that any possible effect of meditation would be so minimal as to be hardly noticeable. That an increase in subliminal scoring was found at all is remarkable, but it does suggest that subliminal perception may be very susceptible to such awareness enhancing procedures as meditation, whereas psi needs rather more than one week of meditation for any effect to be noticeable.

Rao and Puri note four basic assumptions underlying their work:

- "1) Psi is an unconscious process.
- 2) For a better understanding of psi, it may be studied in the same way we do the unconscious.
- 3) The same dynamics that are involved in other forms of subliminal awareness may also be found in psi cognition.
- 4) Conditions that increase the threshold of perceptual receptivity to external stimuli may also be conducive to psi manifestation." (Rao & Puri, 1978).

They also believed that meditation would inhibit sensory perception and enhance one's psi ability, this being

an aspect of Indian meditative techniques. They performed a post-hoc analysis to test this belief. "Assuming that meditation may have enabled some subjects to INCREASE their subsensory threshold and that these subjects are likely to be successful on the ESP task, the ESP results of the subjects obtaining SSP (subliminal) scores one S.D. below the group mean are compared with the rest of the group . . . This (comparison) indicated that only during the post-meditation testing the subjects who obtained SSP scores one S.D. less than group mean showed evidence of ESP. The ESP, however, manifested in the hitting direction for some and in the missing direction for others." (ibid.).

It would be interesting to see what results would be obtained after Zen meditation, which aims to enhance sensory awareness. It is not unlikely that a subject's response to external stimuli whilst meditating may be a function of the attitudes and expectations surrounding the task. Therefore, it is quite likely that the significant negative correlation obtained in this experiment, which runs counter to all the work of Johnson (e.g.1975), Eisenbud (1965), Wiklund (1975), and Kelly, Kanthamani, Child and Young (1975), was in some way related to these expectations.

In a second experiment (Rao, Sundari, Rao & Rao, 1977) they used a weight discrimination task for the subliminal test, in which a person held a weight in each hand and had to say which was the heavier. Meantime in

another room, another person was asked to guess which of the weights held by the subliminal subject was heavier. Thus, for each discrimination there were two subjects, each making their response, the subliminal subject holding the weights, and the psi subject guessing them. The psi responses were matched against both the actual weights (clairvoyance), and against the subliminal subject's guesses (telepathy). This latter condition yielded a significant correlation between the subliminal and telepathy scores as in the previous experiment, but it should be noted that the subliminal responses were at chance level.

More recently, Munson (1980) presented digit targets, 0 - 9, as in the Eisenbud (1965) experiment, with blank slides as psi targets. He attempted to equalise motivation, response strategies and expectancy effects by telling the subjects that some slides were subliminal and some psi targets. He set a subliminal threshold level of 40% correct calls having first established individual threshold levels. The shutter speed was then halved from this level for sixty trials, and then halved again for the final sixty trials. This meant that varying levels of subliminality from near threshold down were being monitored, a marked improvement on previous work. He found that when the subliminal target shutter speed was dropped from the near threshold level to a truly subliminal one, that the psi scoring increased by half as much again. In other words, the

SP and ESP scores converged as sensory cue strength diminished. Munson offers three possible explanations for this:

- "1) A sensory continuum supporting the view that SP and ESP are ranges of similar modes,
- 2) that a limen exists where it could be said that one picks up where the other left off, or
- 3) that SP does mask ESP, and its diminution frees ESP to operate, in spite of the fact that they are different perceptual modes." (Munson, 1980).

This experiment was followed by a study by Munson, Davis and Rao (1981) in which they used objects rather than digits as the targets, the psi slides being ambiguous drawings. The subjects received trial by trial feedback. The experiment elicited significant positive subliminal scoring with a suggestion that feedback enhanced scoring. The psi scores were non-significant overall, but there was an increase in scoring over the trial in the feedback condition. It does appear that this experiment did not use truly subliminal stimuli, but rather threshold ones, since some subjects were aware of the stimulation.

Rao and Rao (1982) ran two further studies, in the first of which they had a subliminal only condition, and a subliminal + psi condition. As in the Munson (1980) study they used picture slides, the psi targets this time being ink smudges. Again they used a partially subliminal

threshold level of 30% correct guesses. They obtained a non-significant positive relationship between ESP and SP scoring in both conditions. Those who scored highly on subliminal targets also scored high on psi targets, whereas those who scored low on subliminal targets had a negative deviation with the psi targets. Neither of these deviations are significant, nor is the difference between the two significant. There was no difference in subliminal scoring for the two conditions, but psi-hitters scored higher than psi-missers in both conditions.

In the second study they utilised two independent groups: a group of meditators (TM) and a control group. Rao notes that: "Though there seem to be no such studies directly related to the effect of meditation on SP as such, there is strong evidence that responsiveness to subliminal cues is greater in relaxed states (Dixon, 1971). The investigations of Dillbeck (1977) and Nolly (1975) suggest that TM may contribute to an effective recognition of tachistoscopically presented visual stimuli." (Rao & Rao, 1982).

Once again the subjects studied TM for one week. They obtained a significant difference for this group in that meditators scored significantly higher on the psi targets. The control group scored in the same direction but non-significantly. The difference between the two groups is significant only for the SP scores. Rao then performed an

Anova on the data and concluded that there was a significant interaction, "which means that whether TM influences ESP depends on the SP performance of the subjects, and that whether SP influences ESP depends on whether the subject meditated. Thus, the ESP scores seem to depend on the interaction of TM and SP." (ibid).

Basically this means that those people who appear open to subliminal and psi stimuli are more greatly affected by the practise of meditation, a finding which tallies with other research. It would be interesting to see if other techniques for altering states of consciousness have equivalent effects. Rao and Rao conclude: "These observations lead us to the conclusion that the way SP and ESP are related may be dependent upon the strength or gradation of the subliminal signals and the state of the individual . . . It may not be unreasonable to assume that the SP in the Rao and Puri (1978) study may resemble perceptual processing more than subliminal processing because the exposure time of the subliminal targets was four times greater than that in the present study. . . . To the extent that SP and ESP are facilitated by altered (dreaming, meditation, etc.) states, their modus operandi may be similar. Since both phenomena belong to the domain of the unconscious, their manifestation may be governed by similar factors at least as far as second stage psi processing is concerned. The obtained positive correlation

between SP and ESP scores of meditators in our study provides some ground for considering that ESP may not be a phenomenon isolated from the rest of the mental processes and that it might be meaningfully related to the other unconscious or subconscious ones . . . Since sensory information processing is generally believed to inhibit ESP, it seems reasonable to assume that when the intensity or amount of sensory stimulation is greater, a relative preoccupation with the processing of these strong signals (even though they are intended to be subliminal) may cause hindrance to the processing of ESP signals. Such a rivalry may not occur between ESP and SP if the latter is indubitably subliminal." (Rao & Rao, 1982). I have quoted at such length from Rao and Rao because this is a conclusion which I also have reached from my research into this topic.

6.4. Free-response Experiments

6.4.1. The Defense Mechanism Test (DMT)

Although Martin Johnson's research with the DMT has already been mentioned (see section 3.1. and 3.4.), it is of relevance here, not because he directly compares psi with subliminal perception, but because he uses results from the latter to predict scoring on the former. The amount of experimentation he has done is extensive: Johnson, 1967, 1971, 1974, 1975; Johnson and Kanthamani, 1967; Johnson and

Nordbeck, 1972; Johnson and Haraldsson, 1979, 1984.

"The principal finding is that there exists a relationship between ESP scoring direction and the degree and quality of "defensiveness" in a subject's DMT protocol. Strong signs of certain perceptual-defensive structures tend to produce psi-missing whereas a low level of defensiveness tends to yield extra-chance scoring." (Johnson, 1974). He also noted that dream recall, or willingness to report dreams, is also related to scoring on the DMT and hence to psi scoring.

Johnson and Nordbeck (1972) investigated the hypothesis that psi-missing can be manipulated by presenting very unpleasant and personally meaningful stimuli to a person who would normally be a psi-hitter (see section 3.4.). In this case, however, he attempted to induce psi-vigilance by prior stimulation, at a subliminal level, of a target in a later psi task. His results indicated that the subject was significantly affected by this induction. These results suggest not only that psi information interacts with subliminal effects, but also that personality correlates for the two phenomena are similar, i.e. someone who is "open" to one of these two forms of "low-level" stimulation will tend also to be open to the other. Seen in this light, the comparison of psi and subliminal perception is essentially a study in awareness of very low level signals, i.e. the psychological processes by

which we can become aware of information that is not normally present in consciousness.

Although not a DMT experiment, I include the next experiment in this section because the rationale behind it is very similar. Nils Wiklund (1975) ran an experiment exploring the relationship between perceptual vigilance to subliminal stimuli and psi-hitting. His subliminal condition was one of creating a visual illusion by exposing a supraliminal square with a prior exposure of a fan-like pattern. If the subjects reported the illusion they were classified as being open to subliminal perception (perceptual vigilance). The time of exposure of the fan-like pattern was successively prolonged until it was perceived. The psi task consisted of three unpleasant (negative) and three pleasant (positive) targets in a clairvoyance matching design, i.e. a forced-choice test in which the person has to match the target envelope with its corresponding concealed picture. He obtained overall significant psi-missing with both types of target, and independent significance with the pleasant targets. Only 3 of the 8 subjects were influenced by the subliminal task. These three subjects exhibited perceptual defence and also significant psi-missing. The two lowest overall scores were obtained by two of these subjects.

Wiklund concludes from this experiment: "The number of subjects was small but it still seems promising to

continue this field of investigation, i.e. to compare general openness for preconscious perception with openness for extrasensory perception." (Wiklund, 1975). Personally, as a result of the Exploratory Study run for this thesis in 1978, I suspect that the psi-missing obtained by Wiklund on ALL his targets, irrespective of content, may well have been due to the presence of the unpleasant negative targets creating a generalised defensiveness to the task.

Wiklund also reports a confirmatory experiment with 23 subjects which gave no significant results at all. He ascribes this lack of any significance to lack of motivation, i.e. boredom again!

6.4.2. Ganzfeld Experiments

Terry (1976) utilised a Ganzfeld situation for the comparison of free-response binary target material under psi and subliminal conditions. However, as the target was in the form of slides, the subliminal targets were presented tachistoscopically but the psi targets were not, so that the two conditions are not directly comparable. He obtained only chance results.

However, when Smith, Tremmel and Honorton (1976) also compared psi and subliminal influence during Ganzfeld stimulation, they found significant retrieval under both conditions. They obtained even greater significance when the AGENT viewed the target pictures subliminally.

These are the only reported experiments utilising an altered state of consciousness and free-response material to examine psi and subliminal perception, which seems rather astounding when we consider the weight of evidence suggesting that this is the most conducive situation for maximising the effects of both phenomena. It is for this reason that I undertook the experiments in this thesis, directly comparing auditory subliminal targets with psi targets heard supraliminally by an agent. The receiver was in the Ganzfeld throughout the session, and the subliminal material was presented below the awareness threshold. The first experiment gave neither significant subliminal nor significant psi results, but there were some significant correlations with the participants' attitude and personality characteristics. The second study gave significant results for both phenomena and a strong positive correlation between them, such that the person who scored above chance with one condition would do so with the other. Once again there were significant correlations with attitude and personality characteristics.

6.5. Physiological Experiments

Although not a direct comparison of the two phenomena, Tart (1963) reports an experiment in which the subject undertook a psi experiment which they were told was a subliminal one. In this experiment the plethysmograph was

used to measure changes in the subject whilst the agent was receiving mild electric shocks in a random order. The GSR was also measured. Significant results were obtained with both measures suggesting that, at a physiological level, the subject was responding to the agent's situation, even though they didn't know it was a psi experiment (see also section 5.2.1).

Beloff, Cowles and Bate (1970) compared autonomic reactions to emotive stimuli under sensory and psi conditions, so once again this is not a true comparison as subliminal material was not used. They obtained significant GSR scoring with the sensory stimulation but not with the psi.

By contrast, Kelly, Varvoglis and Keane (1979) used Ganzfeld stimulation whilst recording the subjects' GSR. The sender was shown an emotional film during the psi period, whilst the subject viewed the film personally during the sensory period. Skin conductance responses for both periods were significantly greater than during baseline periods. However, once again this is a comparison with supraliminal rather than subliminal sensory stimulation.

Johnson and Hartwell (1979) selected subjects according to their scores on the DMT so that they had high and low defensive groups. An agent had to transmit pleasant and unpleasant targets whilst the subjects relaxed in a semi-Ganzfeld situation. The GSR was recorded throughout.

The subject consciously guessed the nature of the target at the conclusion of each trial by pressing one of two buttons. They found that the "higher defensive" subjects guessed slightly more accurately than the others, but not significantly so; that there were no consistent differences in the magnitude of skin potential activity to the two types of stimuli; and that low defensive subjects showed slightly higher skin potential activity to unpleasant stimuli than did the high defensives, but the difference was not significant. Johnson observes that the subject population did not in fact represent extreme groups in terms of defensiveness to subliminal material. But, once again, this is not a direct comparison of autonomic responses to subliminal and psi stimuli.

Therefore, in this thesis I recorded GSRs throughout every session, both subliminal and psi. In the Exploratory Study, there was a significant GSR to the subliminal stimuli only. In the Follow-Up Study there was a significant GSR to the psi stimuli only. These results are therefore rather conflicting and confusing! More research is needed to determine whether or not the two phenomena differ on this aspect of response to the incoming stimulus.

There has been no research comparing personality characteristics and their correlation with scoring on the two phenomena. This is therefore another aspect explored in this thesis.

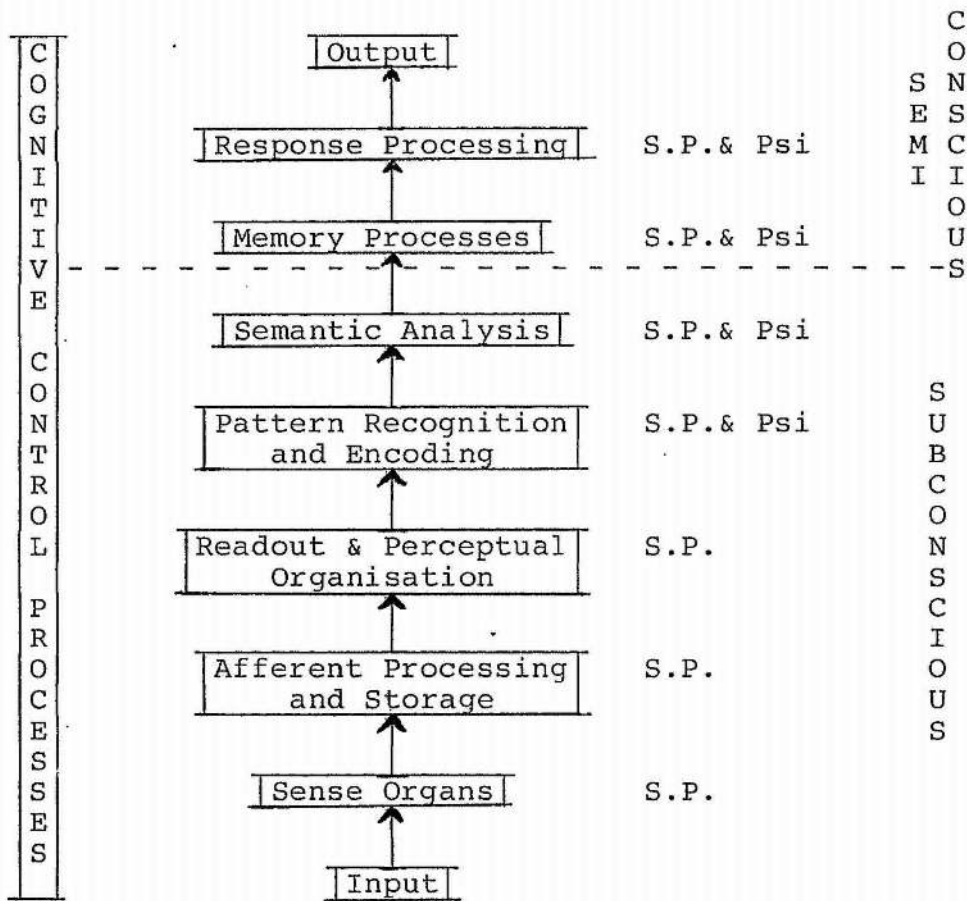
7. Conclusion

We have advanced a long way in our understanding of the subliminal self since the concept was first proposed by Myers in 1903. In fact we have reached the point where we can start to make models showing the various functions of the subliminal self. In order to do this, I have taken an information processing model proposed by Irwin (1979). On it I have indicated those functions known from research to be relevant in the processing of subliminal stimuli, and those which are known to be relevant in the processing of psi. It appears that all of the cognitive processes that are at a "higher" stage than the sensory-perceptual are common to both (see Figure 1).

In using this flow diagram, I am not necessarily implying that it is the best representation of the cognitive processes involved in awareness of incoming information, but it is very simply laid out and therefore suitable for my purpose. It indicates in schematic form a summary of all the research which I have been discussing and indicates the degree of similarity in cognitive processing that appears to be forthcoming for these two phenomena.

Through such research we are beginning to have an inkling of the way in which subconscious information can be tapped, and of the psychological mechanisms at work in subconscious processes. Both psi and subliminal perception appear to be good representatives of these processes. The

Figure 1: Human Information Processing System
(adapted from Irwin, 1979)



information channel utilised by psi information appears to be closely linked with that utilised by subliminal information; not only does psi information interact with subliminal, but personality correlates of the two phenomena seem remarkably similar. It should be noted, though, that these similarities between psi and subliminal perception do not necessarily imply that psi is "pseudo-sensory". What they do imply is that psi inputs are WEAK inputs, and appear

to be processed in a manner similar to other weak inputs. Psi perception does not appear to differ radically from normal sensory modes; whilst there are striking differences between supraliminal stimuli and psi, the subliminal reduces these differences considerably.

Whilst none of the research outlined in this article tells us how we come to have the "psi trace" within the subconscious in the first place, it does lay the foundations for answering this question. By understanding more clearly how we become aware of information per se, and the various ways in which the mind becomes receptive to, and is affected by, outside influences, so we can begin to define the possible mechanism of psi reception.

Chapter 3.

AIMS AND OBJECTIVES

The major aim of this thesis was to compare participants' cognitive, emotional and physiological responses to subliminal and psi targets, whilst in an "altered state of consciousness" designed to maximise awareness of primary process cognition, i.e., those images, thoughts, etc. that are essentially dream-like or hypnagogic. At no time was either I or the participant to know the nature of the experimental condition, whether subliminal or psi, and so I had to use auditory stimuli since these could be masked by the white noise used in the altered states technique called "Ganzfeld", rather than the visual targets normally used in Ganzfeld experiments, since these would be incompatible with subliminal presentation. Thus, until completion of the experiment, only the sender of the targets was aware which session had been run in which condition.

I expected that, out of these identical conditions of presentation, responses would emerge that were characteristic for each phenomena, e.g., the subliminal stimuli would elicit clearer stimulus-related imagery and hence clear and consistent above-chance scoring of the target sheets. I also expected the subliminal stimuli to elicit clear physiological responses as measured by a psychogalvanometer, particularly when the targets had

negative emotional connotations, and I expected the subliminal stimuli to elicit clear emotional responses. I was less certain about the psi sessions since psi has a reputation of being elusive. However, I felt that any psi responses would be weaker than the subliminal ones and that any similarities and differences that emerged between the two phenomena would assist our understanding of the psychological processes by which we become aware of psi information.

The second major aim of the thesis was to be as "global" as possible and explore as many parameters as the participants would permit, thus building up a picture from many different pieces, rather than analysing one aspect in great detail. To this end a large variety of psychological tests were incorporated into the design including attitude-to-psi, susceptibility to hypnosis, cognitive style, cognitive flexibility, hemisphericity, imagery ability, verbal versus visual thought processes, etc. I also explored some other possible response measures that could possibly be affected by the stimuli, namely word association times and the semantic differential. In this way I hoped to build up a whole picture of responses to the different stimuli together with related personality and psychological measures, the more clearly to see the effect of each sort of stimulus on the participant, and hence any distinguishing characteristics. Also, I could find no record in the

research literature of this aspect being investigated.

This meant that I needed to work in-depth with the participants because they each had to take a large number of psychological tests, and I needed to obtain a very accurate assessment of their ability to become aware of the subliminal and of the psi stimuli, so each person had to participate in a number of sessions. This led to considerable statistical problems, because it transpired that most statistical tests are for use either with a large number of people doing one session only, or for a single person doing a large number of sessions. These problems were, however, compensated for by the subjective insights that were gained by working in such a manner.

In the review of the literature it became clear that virtually no comparative work had been done with the participant in an altered state of consciousness, although research in both fields suggested that such states were conducive to increased awareness of the stimulus. This thesis therefore helps to fill that gap. The review of the literature also identified a second major gap, that of the role of personality and individual differences which had never been investigated. This thesis concentrates on these two areas and so is, of necessity, exploratory throughout although there is some degree of confirmation of earlier findings in the later experiments. However, I was on the whole asking lots of different questions concerning

rigidity/flexibility of cognitive style, defensiveness, imagery etc. that gradually developed over the course of the experiments, so as to lay a firm groundwork for future research in this area, by seeing what avenues were worth pursuing further.

In brief, then, the aim of this thesis was to explore all the possible parameters along which subliminal and psi phenomena lie, using a technique intended to maximise awareness of the target.

Chapter 4.

THE PRELIMINARY INVESTIGATION

To Determine Suitable Stimuli and Threshold Levels

Introduction

As already discussed in the literature review, subliminal stimuli have varying perceptual and verbal effects depending on the nature of the stimulus. Neutral stimuli can affect verbal responses subjectively experienced as guessing; emotional stimuli also affect response latencies, threshold levels and the galvanic skin response. A subliminal verbal stimulus appears to activate a complete pattern of word associates, and responses are frequently also of a symbolic nature. Recognition thresholds depend upon the emotional connotation of that which is recognised. The main findings from research on perceptual defence are:

- 1) Duration thresholds for the correct report of emotional, threatening, or anxiety provoking words or pictures significantly differ from those for more neutrally toned stimuli.
- 2) An inverted curvilinear relationship appears to hold between the recognition threshold for visual stimuli, and the extent to which these stimuli are productive of emotion.
- 3) Galvanic skin responses recorded prior to correct recognition are higher for emotive than for neutral stimuli.
- 4) Pre-recognition guesses, as to the nature of a

tachistoscopically presented stimulus, differ between neutral and emotive stimuli.

Aim of the Experiment

- 1) To determine suitable stimuli for further experimentation.
- 2) As a practice run.
- 3) To start selection of suitable participants with whom to work in further experiments.
- 4) To determine the participants' physiological auditory thresholds with a white noise mask, so as to determine a suitable subliminal volume for use in further experiments.
- 5) To obtain recordings of galvanic skin responses and basal resistance levels

METHOD

Participants

There were 16 participants, 10 male and 6 female, aged between 22 and 35 years. All the participants were people who had taken an interest in the project, or were friends of the experimenter. Thus the sample is not a random one, but this in no way interferes with the design of the project.

Apparatus and Materials

A pool of 52 two-syllable words was chosen from Thorndike and Lorge (1944) so that words of approximately equal frequency of usage were used. I specifically avoided taboo words, since research with these had indicated that people free-associated less with these words, as they were likely to occasion perceptual defence (Dixon, 1981). I did, however, incorporate negative emotional stimuli, since these appear to give the greatest physiological reaction.

This pool of 52 words was recorded onto tape as follows: 9 tapes had 17 words each recorded on them. Therefore, each word appeared on three different tapes, so as to control for order effects, and any effect that a particular word combination might create. There were approximately two participants per tape, so each word was heard on average by six people.

Each target word was recorded onto a tape loop, and then transferred onto the master tape at volume levels ranging from a minimum volume of 0, as designated by the volume control of the Gesell tape recorder, through successively increasing volume increments to the maximum volume (10) that the recorder permitted, and then at successively decreasing volume levels back to zero. This is referred to as a "word run".

At the beginning of each word run, three clicks were recorded. The time interval between the clicks and the

onset of the first word in the run was variable, thus preventing any "expectation effects" related to the temporal interval between hearing the clicks and first becoming aware of the target word.

On presentation, the target tape of 17 word runs was mixed with white noise from a Colne Instruments Ltd. white noise generator, at such a volume that the average physiological auditory threshold level for the stimuli occurred approximately half way through the volume scale used. This meant that only occasionally did a participant actually recognise a word since the volume rarely reached the recognition threshold. The white noise mask was used for two reasons. Firstly, Zwosta and Zenhausern (1969) had shown that white noise has a facilitatory effect on visual sensitivity, and secondly because I intended to use the Ganzfeld technique, part of which is the use of white noise to obtain a homogeneous auditory field.

Galvanic skin response was measured throughout each session using an Electronics Developments pschogalvanometer, with a Russian chart recorder H 320-1. Thimble electrodes were attached to the middle finger of each hand.

A throat microphone was connected to the second channel of the chart recorder so that physiological responses could be correlated directly with the session mentation. This session mentation was recorded onto the bottom track of the same tape as the words, so as to enable

precise measurement of the volume level at which the physiological auditory threshold occurred.

After the session, the participant completed a word association test, the reaction time being recorded with a Campden Instruments timer, and a word rating scale of the degree of pleasantness of each of the 52 words. They then tried to guess which of the 52 words had been on their tape.

Procedure

Each participant completed one session of approximately one hour duration. A free-response methodology was used in which the participant free-associated out loud whilst listening via headphones to the target tape mixed with the white noise. The participants were treated in a warm, friendly manner; they were fully aware of the rationale and design of the experiment, the only information withheld being the word pool and the stimuli on their tape. Tea or coffee was offered prior to commencement of the session.

When ready, the participant lay down on a couch in a cubicle separated from the experimenter by a one-way window. They were offered a cushion and a blanket. The GSR thimble electrodes were attached and a check was made that the equipment was functioning properly, and a note made of the basal resistance level. The participant was told that at no point could they move their hands whilst the electrodes

were on.

Next, the throat microphone was hung around the neck, and the headphones put on. The recording microphone was checked to ensure that the participant's voice was being recorded properly, although unfortunately as the recorder was very old, this caused problems.

The participant was then told: "You will hear a tape with white noise on it, and at intervals a word will be heard getting louder and then dying away. You might not be able to recognise it so do not worry about what the word actually is. All I want you to do is to say when you first hear something other than white noise, and then any ideas, imagery, or thoughts that you may have. If you do recognise the word, say so. After reaching a maximum level the word will start to fade until you can no longer hear it, and I would like you to tell me that point at which you can no longer hear it. In between each word you will hear three clicks. These are just timing points for me so that I can correlate the GSR chart record with your threshold levels. We will begin with a trial run of one word."

The trial run was then completed and, after any final adjustments, the remainder of the tape played. The experimenter monitored the tape recorder output, using a footkey to mark the GSR chart each time the clicks were heard. She also monitored the psychogalvanometer, making adjustments to the basal resistance level and sensitivity

when necessary.

At the end of the session, the experimenter returned to the participant and removed the thimble electrodes, etc. The word rating scale and word association test were given, and the participant tried to guess which of the 52 words had been their stimuli. Then they gave an introspective report concerning the session.

RESULTS

Analyses

There were, in all, four measures of the "emotionality" of each word:

1) The word rating scale: This was a direct subjective measure of each word, on a seven point scale ranging from pleasant (1) through to unpleasant (7) (see Appendix 1). This was analysed according to the emotionality of the word, regardless of the direction of the emotion. The neutral point was taken as a rating of 4, and so the difference from 4 indicated the emotionality of the word. This was summed over the 16 participants and the mean found. These means were then placed in rank order, the lower the rank the more neutral the word.

2) Word Association Reaction Time: This was analysed by calculating the median reaction time over all 16 participants to each word. The median was chosen,

rather than the mean, because there was such a high variance that a mean score would not have been a true indicator of the average response time for that word. These median scores for each word were then rank ordered as in (1), the lowest ranks indicating the neutral words. Theoretically, the shorter the reaction time, the less emotional the word. This, however, was found to be contaminated by the "associability" of the word; i.e. some words give an associate far more readily than do others. For example, "cowboy" readily associates to "indian", whereas "spacious" has no single immediate associate. Thus, some words are ranked high, and so emotional, merely because they have no immediate associate, rather than because they are emotional per se.

3) Threshold scores: These were analysed by taking the average volume level (5) and noting the difference from this for each word, both on the ascending and the descending volume word runs. The overall mean threshold level was found for each individual, and difference scores from this mean computed for each word for that individual. This procedure was necessary since there was considerable individual variability. These threshold scores were then summed and averaged for each word, and the words were placed in rank order such that the words with the lowest threshold levels were ranked 1 (least emotional) and those with the highest thresholds as most emotional. The mean threshold was

taken to be the neutral threshold point and the difference from this as a reflection of the degree of emotionality of the word, since s.p. research indicates the existence of both perceptual defence and perceptual vigilance.

It had been intended to ascertain the actual decibel level for each threshold, but unfortunately the building in which the experiment was run was too noisy, and the internal decibel meter on the recorder did not work, so instead volume level as indicated by the volume control on the tape recorder had to be used as the unit of measurement. Owing to the faulty tape recorder these scores are not accurate, and a large quantity of data were not useable. There is a further problem of order effect, those words at the beginning of the tape tending to show higher threshold values.

4) Galvanic Skin Response: The response to each word was assessed by measuring each response during the word run prior to the ascending reported threshold point, i.e. the subliminal GSR. These were then averaged for the people who received each particular word, and ranked such that those words with the greatest skin response were considered to be the most emotional. Since some participants "withdrew" and exhibited little or no skin response, these results are biased towards those words which were presented to participants who exhibited a large autonomic response during the subliminal period of word presentation.

These four sets of rankings were then analysed using Kendall's Coefficient of Concordance (W) in order to determine the level of correlation between the four measures. The sum of the four rankings also gave a measure of the overall emotionality of each word. Since each measure was subject to distortion, the overall rank order should reflect more accurately the emotional level of each word.

Results

Table 1 shows the combined sum of ranks for each word.

The expected value of the combined ranks if there is no correlation between the four measures is 103.9. This gives a coefficient of concordance $W = 0.305$. With $N = 52$, the associated statistical test is the Chi-Square which gives a value $\chi^2 = 47.53$, $df = 51$. This does not reach an acceptable significance level.

It appears subjectively incorrect that words such as "starlight" should rank alongside words such as "outcast", but this is due to ranking the words in terms of neutral versus pleasant/unpleasant. If this ranking order is changed so that pleasant words receive a low rank, through neutral to the unpleasant words receiving a high rank, the coefficient of concordance is even less significant, $W = 0.288$, suggesting that the original method is, in fact, the correct one.

Table 1
Sum of ranks for each stimulus word.

Stimulus	Rank	Stimulus	Rank	Stimulus	Rank	Stimulus	Rank
Dagger	42.5	Hornet	82	Foxy	110.5	Suckle	133
Talon	43.5	Demon	82.5	Snuggle	110.5	Sapphire	139.5
Cowboy	50	Inject	83	Maggot	113	Vermin	142
Cobweb	56	Dentist	86	Mellow	113	Comet	143.5
Circus	57	Vomit	87	Panther	114	Carnage	146
Phantom	60	Bondage	87	Coffin	116	Spacious	146.5
Whisky	65	Fondle	95.5	Lagoon	118.5	Stagnant	147
Goblin	65.5	Python	96.5	Despot	119.5	Vulture	147.5
Threshold	72	Cosmic	99	Tranquil	120.5	Hangman	148.5
Spider	74	Bonfire	103.5	Nightmare	122.5	Caress	151
Gypsy	76.5	Cripple	105	Fascist	123	Starlight	157
Feline	76.5	Magic	106.5	Kidnap	125	Cancer	161
Satan	81	Dancer	107.5	Cocoon	126.5	Outcast	177

The participants' attempt to guess which words had been present on their tape was analysed using the methods of signal detection theory. The results showed no indication of significance at all, apart from one participant who had $d' = -2.975$, due to his missing every target word!

DISCUSSION

Despite the lack of significance, the aims of this preparatory study were realised. It helped me to begin determination of suitable stimuli for future work; a selection of the participants in this experiment carried on with me in the following Ganzfeld experiments; it served to familiarise me with some of the techniques used in Ganzfeld research, and also with the GSR; it helped me to determine a suitable subliminal volume for future work.

Examination of the free-response transcripts and the GSR chart records obtained for each participant, indicated that there was some sort of GSR/imagery continuum. Those people who found it difficult to free-associate and who exhibited little or no imagery tended to have exceptionally responsive GSRs. These people also showed a heightened threshold level and a rather analytic cognitive mode, analysing the word sounds and trying to guess the meaning of the word from the perceived sounds.

At the other end of the continuum there were participants who exhibited a highly imaginative cognitive mode. For example, one participant "felt" different colours for the different words, and showed a pronounced dislike for the word "outcast" saying: "I don't like it - - there's something funny out of this that I don't especially like - - - it's like there's someone saying they're hunting you or

something."

It is worthy of note that most of the words consciously reacted to were the negative emotional words. These words also produced the greatest autonomic response. The positive emotional words appeared to have very little effect on the participants' mood, free-associations or GSR, other than a general relaxation effect.

The GSRs of the high imagery participants mirrored their responsiveness to the stimuli. Two of the participants exhibited high imagery which was unrelated to the stimuli. Their GSRs are similarly unrelated, one person showing a highly withdrawn skin response pattern, and the other a very "noisy" pattern of response related to his own talking rather than to the stimuli. The two participants whose imagery was related to the stimuli exhibited GSRs that were both responsive and stimulus related.

On the whole most of the participants enjoyed the experience, but three people were very upset by it. Unfortunately (?) the tape recorder did not record the free-associations of two of these people, but it should be noted that they all had tapes with a high proportion of negative words, and their GSRs reflect this, being highly aroused and extremely variable. One of these participants disliked the experience so much that he, in his own words, "cut himself off from it", and his GSR reflects this by a very sudden cessation of all response about half way through

the session.

Having completed this preliminary investigation, I was advised to have one pool of words for each session that a participant undertook in the forthcoming Ganzfeld experiment. I, therefore, chose 150 words of approximately equal frequency from Thorndike and Lorge (1944), and asked 16 first-year Psychology undergraduates to do both a word-association test with reaction times, and then to rate them on a word-rating scale from pleasant through to unpleasant, as in the above experiment. These gave a measure of emotionality for these words utilising two of the four methods of the preliminary study. From this pool, 100 words were chosen for the first Ganzfeld experiment.

Conclusion

This was a useful preliminary run to the main experiments in this thesis. Although not yielding significant results, it gave some idea of variables to be expected in further experiments.

Chapter 5.

EXPLORATORY STUDY

To Compare Psi and Subliminal Perception Using the Ganzfeld Technique

Introduction

The aim of this study was to explore psychological and physiological responses caused by psi and subliminal stimuli under identical experimental conditions designed to induce an altered state of consciousness. As mentioned in the literature review, there have been very few experiments comparing the two phenomena whilst the participant is in an altered state; even less which have recorded physiological responses; and none which have compared personality characteristics related to personal awareness levels of the two phenomena. Being a "synthesist" rather than an "analyst", I decided to incorporate all these variables into one large multi-variate design, rather than running a number of smaller experiments.

The design of this experiment was reported at the 21st. Annual Convention of the Parapsychological Association, 1978 (Roney - Dougal, 1979a), and the results were reported at the 3rd. International Conference of the Society for Psychical Research (Roney - Dougal, 1979b). Together with the Follow-Up Study, this experiment is being published by the Journal of the American Society for Psychical Research (Roney - Dougal, 1987).

Since subliminal perception has never been studied under Ganzfeld conditions, 50% of the sessions utilised a full Ganzfeld consisting of visual attenuation and accompanying white noise, and 50% a partial Ganzfeld of white noise alone. The aim of this variable was to investigate whether the full Ganzfeld enhanced awareness of subliminal stimuli. In subliminal perception research, negative emotional stimuli are used in studies of perceptual defence - vigilance, and in those utilising physiological reactions to stimuli. Negative targets have rarely been used in psi research, so a further variable incorporated into this study was that of emotionality of target material, pleasant, unpleasant and neutral targets being used.

In conclusion, the aim of this exploratory study was to explore all the possible parameters along which s.p. and psi might overlap. No formal hypotheses were made, but I did expect the subliminal material to emerge with greater clarity and consistency than the psi, especially at the cognitive and physiological levels.

METHOD

Participants

Ten participants volunteered to be receivers. Some of them had assisted in the previous experiment, but none had any prior experience with the Ganzfeld. All concerned knew that this experiment was exploratory with no fixed hypotheses. All participants were, or became, friends with the experimenter during the course of the experiment which lasted several months. Their ages ranged from 23 to 38 years; four were female and six male; most were postgraduate students, with one musician, one nurse, one typographer, and one person unemployed.

The sender was a postgraduate student working in the Optics Department of the City University, London, where the experiment took place. He was fairly sceptical with regard to psi phenomena and neither knew nor met most of the receivers. In return for his assistance, the experimenter was a subject in his research.¹

Apparatus and Materials

A Ganzfeld technique was used in which the participant sat in a comfortable chair in a Faraday chamber. A homogeneous auditory field was created by a white noise generator (Colne Insts. Ltd.) connected via a junction box to Koss Pro 4 headphones. The homogeneous visual field

was created by taping halved ping-pong balls over the eyes with a 40 watt red light 18 inches away from the face.

The target tapes were played on a Philips N4418 tape recorder at a preset volume, and connected either directly to the sender's headphones (psi sessions) or to the receiver's headphones (s.p. sessions) via the junction box. The receiver's mentation was recorded on a Philips N4307 tape recorder which was monitored throughout the session by the experimenter. At the end of the session this mentation was related to a target pool containing 5 target themes, of which one was the target for that session, and these were rated on a six-point scale according to the degree of correspondence with the mentation. No specific judging procedure was used, and the participant did not have notes on their session mentation to refer to, relying solely on memory. This rating procedure gives a measure of the degree to which the subliminal and psi stimuli affected conscious target choice behaviour, and thus some idea of the extent to which target related mentation was present during the session.

Three further classes of response to the target were measured:

1) Physiological:

Continuous chart records, on a Russian recorder H-320-1, of palmar skin conductance as measured by a psychogalvanometer (Electronic Developments Ltd., 8

microamps, D.C.) were obtained for all sessions. Palmar electrodes, 5cm. in diameter, were attached to the left hand dry.

2)Affective:

Mood reports, based on an amended version of the Nowlis Mood Adjective Check List (Carpenter, 1968), were completed just prior to, and immediately after, each session-day.

3)Psychological:

An attitude-to-psi questionnaire, taken from Palmer (1971), was completed prior to the first session.

The Ås Openness-to-Experience Inventory (Ås et al, 1962), which was originally designed to measure susceptibility to hypnosis, was completed prior to the second day's sessions. This was slightly amended so as to equalise positive and negative responses.

The Witkin Embedded Figures Test, Part A (Witkin et al, 1962), which is a measure of "globality" of cognitive style, was given prior to the third day's sessions.

(The Kinsbourne Eye Movement Test, designed to measure "hemisphericity" was given at the end of the second session, but the data were so unreliable that they were discarded.)

There were three independent judges who assessed the session mentation for degree of correspondence with the

target in a manner similar to the participants. In order to attempt to determine the best sort of judge for my purposes, I enlisted the help of three different "types" of judge:

- 1) A trained psychotherapist with considerable experience with, and knowledge of, the field of s.p. research;
- 2) A "psychic";
- 3) A "naïve" person, a poet by trade.

There was a "communication light" between the sender and the experimenter, so that the sender could indicate the beginning and end of the sending period. This also triggered the pen on the chart recorder for later analysis of the GSR.²

Stimuli

Verbal stimuli were prerecorded on tape. Each target consisted of five thematically related words (see Appendix 2) chosen in the following manner: The 150 words which had been circulated as described in the preliminary experiment, were sorted into the 40 most pleasant, the 40 most unpleasant, and 20 neutral words. These were then placed into groups of five words, each group being more or less thematically related, apart from the neutral groups. This made a total of twenty target tapes, 8 with pleasant themes, 8 with unpleasant themes, and four with neutral themes. These 20 tapes were then divided into four target

pools containing 5 target tapes each: 2 pleasant, 2 unpleasant and 1 neutral. Each target theme was as distinct as possible from any other theme in the pool.

The five target words were recorded onto the tape at identical output volume as measured by a dB meter, by means of a tape loop so that each word was repeated three times. There was a two-minute interval between words, so that each target tape lasted for ten minutes.

Session Design

There were 3 session-days per participant, each day being divided into two sessions of 30 minutes, i.e. six sessions per participant, sixty sessions in all. These six sessions per participant were divided into three groups:- 2 psi, 2 subliminal and 2 control. One of each group was undertaken with a full Ganzfeld, and the other with a partial Ganzfeld, the order being counter-balanced over the three session-days.

The subliminal stimuli were presented at a preset threshold volume, identical for all participants. Lack of equipment prevented a specific decibel level being established, so the tape recorder volume and white noise volume were set during pre-experimental trials run by the experimenter, who insured that the stimuli were completely inaudible even after habituation to the white noise, whilst being recognisable without the white noise mask. This is

not really adequate, and proper equipment was obtained for the Follow-Up Study.

The psi sessions involved a sender who was instructed to concentrate on the target and try to "send" it to the participant. Thus the form of psi used was essentially telepathic, although clairvoyance and precognition cannot be ruled out by this design.

The control sessions were included in order to assess the baseline shift in mood due to the experience of the Ganzfeld per se, and to assess any baseline measure of change in skin resistance. No targets were chosen and so there was no post-session judging procedure on these occasions. A blank tape was played during the session.

Each participant received one target tape per target pool and had a different target pool for each session. The control, psi and subliminal conditions were run in a semi-random order predetermined by an independent person, who prepared sealed envelopes containing instructions for the sender. The order of the target pools and tapes were also semi-randomly assigned within the constraints already mentioned, that each participant receive each experimental condition and each pool only once. No person participating in the experiment had any prior knowledge of the experimental condition, pool or target tape. Target feedback was given at the end of each session, and feedback as to experimental condition at the end of the

experiment, apart from the control sessions which were self-evident as there was no judging procedure.

Procedure

On arrival the participant was offered light refreshment and given ten to fifteen minutes to settle down. The participant then entered the Faraday chamber and completed the mood report and any relevant questionnaire. The procedure was then stated as follows:

All that I want you to do is to free-associate, i.e. talk about whatever is going through your head. It is important not to think about it, merely to observe your thoughts, images or whatever else happens, and to say what is going on. You will find that the more you relax and just let go, the easier it will be - - - it becomes a bit like talking to yourself out loud. Passive awareness is the key concept. Also, the more you relax the nearer you will come to sleep, so try at all times to keep your eyes open and to talk. While you are in here the sender will play a tape. Either you will perceive the words on the tape subliminally, or the sender will hear them and you will "perceive" them either by telepathy or clairvoyance. On two occasions a control tape will be run which has no words on it at all, and this will be the only time until we have finished the whole experiment that you will know at the end of the session which condition you were taking part in, as there is

no judging procedure afterwards. The other thing it is important to remember is not to move your hand, because it disturbs the GSR.

After the procedure had been discussed, the palmar electrodes were affixed and, in full Ganzfeld sessions, the halved ping-pong balls were placed over the eyes. The headphones were then put on, and the white noise turned on at the pre-set volume. The participant was then left alone in the Faraday chamber. There was a ten-minute relaxation period followed by a ten-minute sending period, ending with a ten-minute relaxation period. During the first relaxation period, the sender was informed that the session had begun. This meant that the sender had minimal contact with the participants. He collected the appropriate sealed envelope which he kept in a locked drawer, and acted according to the instructions. On subliminal sessions he would disconnect his own headphones; on psi sessions he would disconnect the participants's headphones. At the beginning and at the end of the sending period, the sender pressed a light, indicating that the session had begun, for the experimenter who was monitoring the participant's session mentation and GSR record.

At the end of the session, the sender replaced his instructions in the envelope, returned all equipment to normal (e.g. rewound the target tape, reconnected the headphones, etc.), and left for his room, putting out for

the experimenter the appropriate target pool sheet on a table in an adjoining room. At the end of the second relaxation period the experimenter collected this sheet, turned off the white noise, and entered the Faraday chamber, removing the participant's headphones and electrodes. The participant then judged the five possible target themes for degree of correspondence with their session mentation, using a six-point rating method. Feedback was obtained from the sender as to the target.

Some two hours later, the participant undertook a second session of full or partial Ganzfeld as appropriate. At the end of this session the post-session mood report was completed.

Some weeks later, typed transcripts of each session were sent to the three independent judges together with the appropriate target pool, and these were assessed by the judges for degree of correspondence with the mentation using the six-point rating scales

RESULTS

1) Cognitive

The ratings of the target pools were assessed according to the Palmer method (Palmer & Vassar, 1974; c.f. Stanford & Sargent, 1983), i.e. the ratings were converted

into z-scores, and these were analysed using the appropriate t-test. They were analysed to determine whether the target had been chosen overall greater than would be expected by chance; whether the s.p. or the psi stimuli had been chosen greater than chance expectation, and whether or not there was a difference between these two conditions; whether there was any effect of full or partial Ganzfeld, and whether there was any difference between these conditions; and finally, whether there had been any effect from the different types of target, and any differences between these.

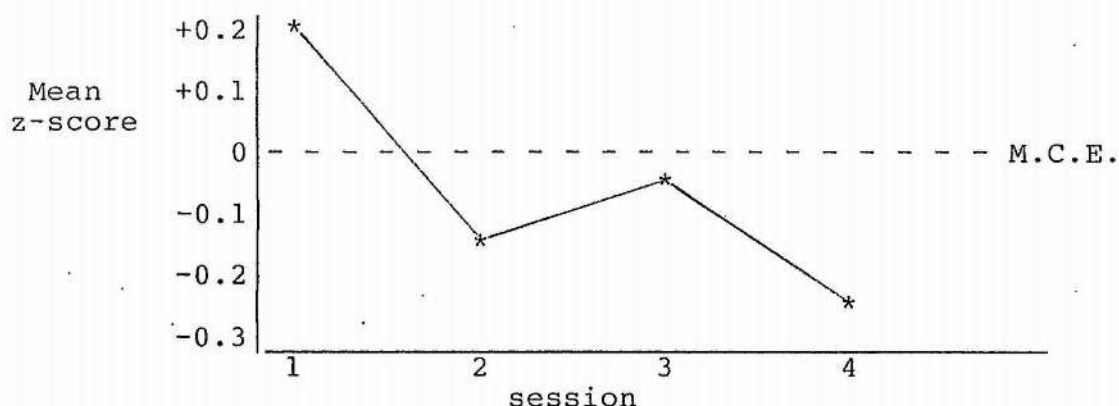
The results of these analyses are presented in Table 2.

Table 2
Participants' Judging of the Targets

Experimental Condition	No. of sessions	% of hits	Rating z-score	t	p	Diff. between conditions
Overall	40	42.5	-.095	0.699	n.s.	
S.p.	20	40	-.148	0.759	n.s.	>0.357;ns.
Psi	20	45	-.069	0.219	n.s.	
Full Ganzfeld	20	51	+.003	0.013	n.s.	>0.582;ns.
Partial Ganzfeld	20	37.5	-.194	1.232	n.s.	
Target type:						
Pleasant	18	55	+.021	0.116	n.s.	>0.821;ns.
Unpleasant	15	33	-.209	0.953	n.s.	
Neutral	7	43	-.151	0.331	n.s.	

Whilst all these results are statistically nonsignificant, there is still some useful information to be gleaned from them. More "hits" (defined as a positive z-score for descriptive purposes only) were obtained using a full Ganzfeld and with pleasant targets. It is interesting to note here that many participants remarked during the sessions on this difference; some people preferred the Ganzfeld as they found unrestricted visual input was distracting. There was a very clear difference between the unpleasant and pleasant targets, nearly twice as many hits occurring in the pleasant condition. Some people had very "bad trips" owing to the unpleasant targets, and this could well be the prime cause of the overall chance results; the negativity from one trial carried over into the others. Figure 2, showing the average scoring over trials, indicates a cumulative negative, or decline, effect over the whole experiment, the participants initially scoring above chance and thereafter below.

Figure 2
Average Scoring over the Sessions



This decline effect is significant, $\chi^2 = 139.5$, 3df, $p = .001$, despite the small number of sessions. This decline may be related to the traditional decline effect, but with regard to this experiment which has far fewer trials, I feel it was the negative effect of the targets rather than the more motivational - cum - boredom effects of the traditional forced-choice experiments (Mitchell & Drewes, 1983).

Thus, although the main results were nonsignificant statistically, there are suggestive differences in the results which can be followed up in future work. These trends are in line with subjective judgements made by the experimenter and the participants during the experiment.

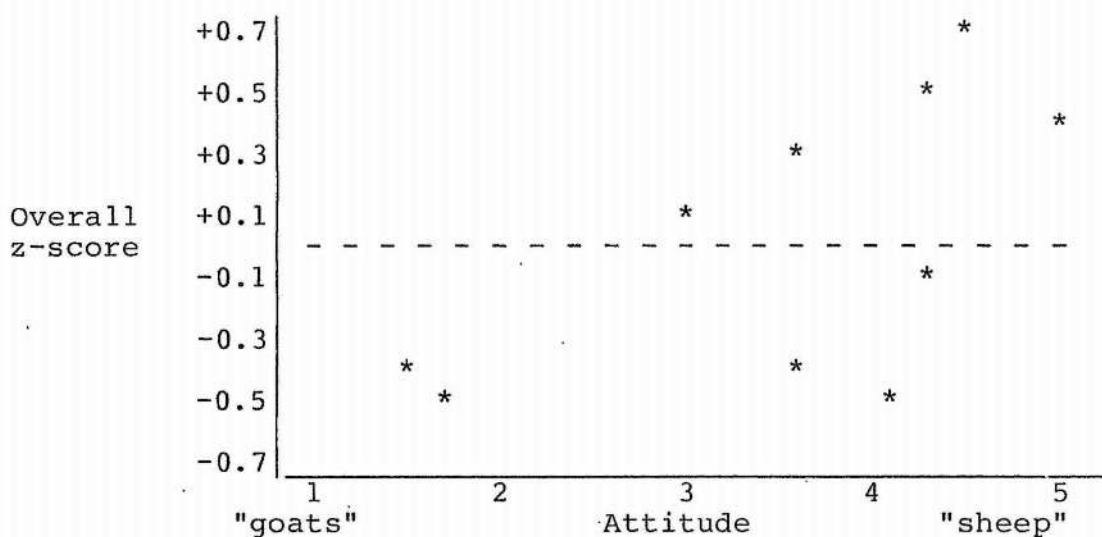
2) Personality

For each participant, scores from the attitude questionnaire, the As Inventory, and the Witkin Embedded Figures Test (EFT) were obtained. These were scored, ranked and correlated with the target z-score by using Spearman's rank correlation coefficient (r_s). The attitude scores were also correlated with the As Inventory and with the EFT. The "sheep" were then separated from the "goats" on the basis of their attitude score, and the difference in target scoring was analysed using a t-test.

Attitude

Overall target scoring correlated with attitude towards psi phenomena at $r_s = .42$, $p = .075$, which is not significant (see Figure 3), but considering the small number

Figure 3
Correlation between Attitude and Overall Z-score



is in fact a very clear correlation. The subliminal scoring gave $r_s = .585$, $p = .05$, which, again considering the small number of participants, is remarkable verification of Schmeidler's observation that one's attitude is a strong determinant of scoring direction (Schmeidler & McConnell, 1958), only this time with subliminal perception!! This trend would have been even stronger had not one "super-sheep" scored the target last on every session. This correlation did not hold for the psi scores, $r_s = -.17$, $p = n.s.$

Thus, overall the sheep tended towards chance scoring ($z = +.001$) and the goats towards psi and s.p. missing ($z = -.513$). The difference between these scores is $t = 1.404$; $df = 8$, $p = .09$. The trend indicated is that the attitude of the participant is to some extent related to the direction of overall and s.p. target scoring.

The As Openness-to-Experience Inventory

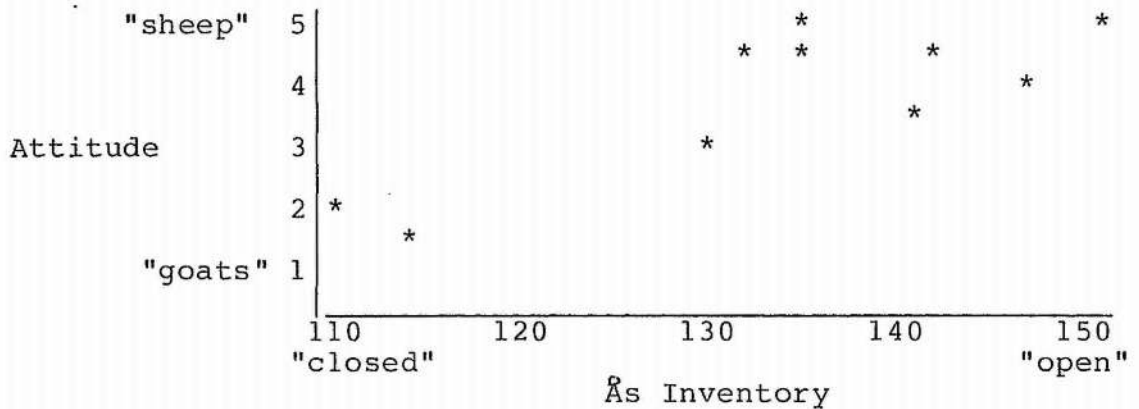
The data from this inventory were correlated both with the target z-scores and with the attitude scores using Spearman's rank correlation (r_s). The correlation with overall z-score gives $r_s = .331$, with s.p. z-score gives $r_s = .294$, and with psi z-score gives $r_s = .046$., none of which are statistically significant. All correlations are in the direction indicating that the more "open" the person, the more positive their target score.

The correlation with attitude is significant, $r_s = .72$, $p = .018$, thus independently strengthening the sheep-goat grouping (see Figure 4).

The Witkin Embedded Figures Test

This test was correlated both with target z-scores and with the attitude scores using Spearman's rank correlations. On a post-hoc basis the data were transformed in the following manner: The participant's score was subtracted from the median to give an index of

Figure 4
Correlation of Attitude and "Openness"



"extremeness"; in the case of attitude this median was 3, and with the z-score it was 0. Thus, the absolute values of the deviations from the median are being correlated with the Witkin EFT. The resulting correlations were:

Witkin and overall z-score: $r = +.685$, $p = .03$;

Witkin and s.p. z-score: $r = +.285$, $p = \text{n.s.}$;

Witkin and psi z-score: $r = -.018$, $p = \text{n.s.}$;

Witkin and attitude: $r = +.724$, $p = .02$.

The interpretation of these correlations is that the more extreme one's attitude, be it sheep or goat, and the more extreme one's z-score, either in the hitting or missing direction, the more "global" one's cognitive style, as defined by Witkin et al (1962). Since the EFT is basically a spatial-visual task and yet at the same time demands that the person analyse the figure, ease with which the task is performed is possibly a function of

hemispheric coordination, or cognitive flexibility (Ihilevich, 1968). Since extreme hitters and missers are both exhibiting some level of awareness of the target, this test is valuable in that it demonstrates a common feature between the two, albeit on a post-hoc test which obviously requires confirmation.

3)Physiological

Changes in skin resistance were analysed by averaging 30-second epochs prior to, and just after, stimulus onset, i.e., the point at which the target word was heard either by the sender (psi) or subliminally by the participant as indicated by the sender's communication light. The average change in skin resistance was then converted into conductance and analysed using the appropriate t-test. Shifts in "trend" were also obtained by determining the regression line prior to, and just after, the stimulus point, and subtracting the difference in slope of the two regression lines. Because the stimulus always occurred at two-minute intervals, it was possible to mark equivalent intervals on the chart record of the control sessions, and analyse these as for the experimental sessions.

Unfortunately, a large quantity of data were lost due to equipment problems, so that data from only seven of the participants could be used for analysis. Further,

precise stimulus points were not recorded on the chart record other than the initial stimulus, so the reliability and accuracy of these data leave a lot to be desired. However, for what they are worth, the results are presented in Table 3.

Table 3
Changes in Skin Conductance at Stimulus Onset.

Experimental Condition	Conductance (μ mho)	Trend
Control	+0.061	1.08
S.p.	+0.226	14.60
Psi	+0.080	4.55

These results are not statistically significant, but the trend is in the expected direction as the subliminal sessions exhibit the greatest skin conductance change, with the psi sessions exhibiting a far lower level of response in the same direction. An examination of the overall basal conductance level for each session confirms this, the lowest overall conductance level being for the control sessions (10.94 μ mho), the highest for the subliminal sessions (15.27

μ mho), with the psi sessions once again in between (11.33 μ mho). This suggests that the s.p. sessions did create an "attentive" set, even though the scores do not show a significant difference because of the very high variance exhibited.

4) Independent Judges

The three independent judges rated the participants' session mentation transcripts with respect to the appropriate target pool, using the same method as the participants. These ratings were converted into z-scores and analysed using the appropriate t-test (c.f. participants' target score analysis). These target scores were analysed for overall significance, for s.p. and psi significance, and for the effect of the pleasant and unpleasant targets, for all three judges. The relationship between the judges' scoring was tested using Kendall's Coefficient of Concordance (W). The results are presented in Table 4.

Overall, the psychotherapist (Judge 1) scored nonsignificantly above chance. He scored relatively better on the subliminal and on the pleasant sessions, but there was no significant difference between conditions. The naïve judge (Judge 2) scored at chance level overall. He scored negatively on the unpleasant targets, and on the subliminal sessions, but once again there was no significant difference between conditions. Overall the psychic (Judge 3) scored

Table 4
Judges Ratings of Targets (Z-Scores)

	Exp. Condition			Exp. Target	
	Overall	S.p.	Psi	Pleasant	Unpleasant
Judge 1 (psychotherapist)	+0.189	+0.191	+0.187	+0.338	+0.193
Judge 2 (naïve)	+0.007	-0.113	+0.127	+0.083	-0.343
Judge 3 (psychic)	-0.306	-0.447	-0.165	-0.316	-0.336

significantly below chance ($t = 2.155$, $p = .04$). This negative scoring was concentrated on the s.p. sessions which were independently significant ($t = 2.285$, $p = .04$). All analyses are two-tailed. Once again, the unpleasant targets were rated more negatively, but there is no statistical difference between the conditions.

When the Kendall Coefficient of Concordance is applied to the data, there is a significant agreement between the judges, $W = 0.879$, $p = .01$. Thus, despite their personal differences, the judges were all more accurate with some transcripts than with others.

The results suggest that, for outside observers, the subliminal sessions and those with pleasant targets contain relatively clearer evidence of target related imagery.

DISCUSSION

Although this exploratory study appears to be of little value because most of the results are statistically nonsignificant, a closer look, coupled with personal insight, reveals a large quantity of instructive information - - primarily on how not to run a Ganzfeld experiment!! In "A Guide for the Perplexed", Schumacher (1978) makes some pertinent comments about scientific experimentation. He discusses two types of science: instructional and descriptive. Instructional science is that which I have just presented; descriptive science has, however, a part to play in that its guiding principle is the concern that: "I must be careful not to leave out anything of significance." (ibid). Instructional science is more effective the more rigorously it excludes all factors that are not strictly necessary. This thesis is designed to blend these two aspects of science, and I shall now describe those "findings" which arose during the course of the experiment, and which cannot be subjected to statistical analysis without losing much of their meaning.

As stated in the introduction, this was an exploratory study with no fixed hypotheses and only vague expectations. With so many variables and so few sessions per participant, I did not expect significant results, and I did not get them. However, as a first Ganzfeld experiment,

it provided some very good lessons.

I learned that one should never do more than one session per participant per day, a "finding" which Sondow (1979) and Stanford (1984) both note. An example of this is S1 who hit the target on every session except the last. For his first session of that day he had a most unpleasant target, which he scored correctly. Unfortunately, the effects of that negative session "carried over" into his second session so that he rated a pleasant target incorrectly, even though his mood had improved over the session and his target shows clear evidence of target related imagery. He remarked on this at the time.

Which brings me to a second "finding". There was a distinct difference in the hit rate of pleasant and unpleasant targets - - not a statistically significant one, but a personally noticeable one. Many of the participants had very bad experiences during sessions with unpleasant targets, and this could well be the prime cause of the overall chance results, and of the decline effect as stated earlier. It must be remembered that in the Ganzfeld, the participant is in a dream-like state of consciousness and is reporting material emerging from the subconscious. To subject this person to unpleasant targets is, in my opinion, thoroughly unethical and is something I will never do again. In studies of perceptual defence, the person is not in an "altered" state of consciousness, and is required merely to

press a button, or some equivalent task, and so negative stimuli do not have such a profound effect and are consequently viable as targets, but not within the Ganzfeld setting. The data from the judges also reflects this finding, particularly that of Judge 3 which was significantly below chance, and that of Judge 2 who avoided the negative targets repeatedly. It is strongly recommended that stimuli as negative as those used in this experiment should not be given in research of this kind, out of consideration for the participants.

A third point of interest is the overall nonsignificance of the subliminal sessions. As stated in the literature review, Dixon (1971) has pointed out that: "We have, after all, to explain why it is that some experimenters, some academic departments, and even some countries, invariably provide positive evidence for subliminal perception effects while others with almost equal monotony do not." (p.242). When one obtains null results in a psi experiment, the usual assumption is that there is no psi "present". However, one cannot say that there was no subliminal stimulus present, because physically there was. For some reason, though, this stimulus did not affect cognitive target choice behaviour or physiological response sufficiently to result in statistical significance.

One possible reason for this could be that there was a mixture of perceptual defence and perceptual vigilance

operative among the various participants, which would obviously result in overall null results. This is related to individual difference factors, some of which were tested for. Obviously, the most important factor to consider is that of attitude which did correlate significantly with the vigilance or defensiveness of the individual in so far as they consistently hit or missed the target at the judging part of the procedure. Thus, overall those with a more open attitude showed enhanced awareness of the subliminal stimuli. But even this is subject to "noise". For example, as remarked on in the results section, there was one "super-sheep" who rated the target last on every session, scoring as negatively as the two goats. This was not statistically significant owing to the small number of sessions, but was so marked that we discussed it in some depth. Her subjective comments regarding this were that she was ill at the time, and under considerable personal stress due to marriage problems. This person has a life history of quite remarkable psychic experiences, and in the next experiment actually scores a hit on every session, so her judgement should, therefore, not be lightly dismissed. One could attribute her incorrect scoring of the psi stimuli to her not "perceiving" them, or to there being no such phenomenon, but one cannot so easily explain away the subliminal. I would, therefore, hypothesise that the psi stimuli were being rated last for equivalent, and possibly

similar, reasons as the subliminal stimuli.

This hypothesis does not rest on just this one case. If we turn our attention to the two "goats", we find equivalent, though still non-significant data. One of the goats scored negatively on every session, and the other goat scored a "hit" on only one session - - that session being a psi one! Their negative scoring on the subliminal sessions is a classic case of perceptual defence such as Martin Johnson uses in the DMT (Johnson, 1975). In this case, their perceptual defence is quite clearly correlated with their attitude, and provides further corroboration of the classic "sheep-goat" findings. It appears as if the defence mechanism used, both with the "goats" and with the "super-sheep", was that of denial, as the independent judges provide objective evidence for target material being present within these transcripts, e.g. session 4 for one of the goats was rated first by all the judges, although the goat personally missed that target, and two of the judges scored above chance with the "sheep". Thus, I further hypothesise that the psi and subliminal missing is not so much due to a lack of awareness at the reception stage of the process whilst in the Ganzfeld, as due to an avoidance of the target during the judging stage of the process, although possibly both processes are at work. It must be stressed that these speculations are being offered as hypotheses for testing, and are merely observations made during the course of the

experiment.

Further light is shed on the process by the As Openness-to-Experience Inventory which correlated positively and significantly with the attitude questionnaire. This inventory was originally designed to predict susceptibility to hypnosis. Thus, the "sheep", as well as believing in psi, are also most open to altered states of consciousness and to peak experiences, are tolerant of logical inconsistencies and regressive experiences, and are willing to relinquish ego control. The goats are relatively closed to all of these aspects of life experience.

Despite the lack of a significant difference between the s.p. and psi conditions, some slight differences between these phenomena did emerge; the physiological data recorded a stronger overall skin conductance response to the s.p. stimuli, and two of the independent judges scored "better" with the s.p. material. However, no clear differences emerged at the subjective level; some of the participants scored better with one condition and some with the other, and no one could tell which condition was which. Thus, no conclusions can be offered with regard to this facet of the experiment.

The results from the independent judges, although not statistically significant do offer some suggestive hypotheses for further experimentation. The statistically significant results for Judge 3 were in the negative

direction, suggesting that she was, in some sense, not an impartial judge. I would suggest that her "perceptual defence" was a result of the unpleasant targets which seem to have coloured the whole experiment, and which, in her case, emerged more clearly with the subliminal material. The naïve judge also appears to have avoided the unpleasant targets, thus resulting in overall chance scores. I would, therefore, suggest that a psychotherapist, or some other judge trained to be objective and with experience of primary process mentation, would be the most appropriate type of judge in research of this kind.

The two participants whose transcripts were related most consistently to the correct target by all three judges are S5 and S9; S5 was a goat who scored three misses! An obvious example of personal defences at work in his judging of his own mentation. S1 personally obtained three hits and was the best participant in the whole experiment, yet none of the judges were able to relate his transcripts to the target. His mentation is very bizarre and his associations unique, which seems to be a possibly important factor with "natural" as opposed to "trained" psychics.

Conclusions

I attribute the overall chance results primarily to my own and the participants' naïvety with regard to eliciting and becoming aware of the subliminal and psi

information; and secondly, to the use of negative emotional targets which coloured the whole experiment. The lack of significant difference between the subliminal and psi conditions is what makes this interpretation most feasible, since the subliminal stimuli were definitely being transmitted to the participants; they just had trouble becoming aware of them! The strong effect of the negative unpleasant targets also shows up in the judges' scoring. Whether this missing is due to a rejection of the material at the reception end of the process, or due to an avoidance of these targets during the judging is not clear, but there are some signs of denial of target-related information present in the transcripts.

The most significant aspect of the experiment is the relationship between the individuals' scoring and the various psychological tests. However, all these results are very preliminary and definitely require corroboration.

Chapter 6.

THE FOLLOW-UP STUDY

Introduction

The methodology of this study is similar to that of the exploratory study in that I have utilised a multivariate design together with the Ganzfeld technique. However, certain specific changes were made in order to ensure a more psi-conducive environment:

- 1) All the sessions in this study utilised a full Ganzfeld;
- 2) Only one session per participant was run on any one day;
- 3) All target material was of pleasant stimuli;
- 4) A specific judging procedure was utilised;
- 5) Trained independent judges judged the session transcripts;
- 6) A relaxation tape was played prior to the stimulus period;
- 7) Participants were encouraged to choose their own sender;
- 8) Specific decibel levels were set for the subliminal stimuli;
- 9) All the participants had prior experience with the Ganzfeld.

Certain specific hypotheses were made for this experiment:

- H1) There will be a correlation between a participant's score on subliminal and on psi sessions, i.e. those who tend to hit the target will do so under both conditions, and those who tend to miss the target will miss under both conditions.

Overall, above chance scoring was expected.

H2) Attitude to psi will be related to target score in that "goats" will tend to miss the target and "sheep" to hit it. Attitude will be related to "openness-to-experience" and to cognitive style as measured by the Witkin EFT (Witkin et al, 1962). Cognitive style will also be related to target score, both these relationships using the transformed data indicated in the exploratory study.

H3) Physiological responses to the stimuli will be of greater magnitude in the subliminal sessions, responses in the psi condition being in a similar direction but of smaller magnitude.

Thus, this experiment was designed to explore further those parameters of response to s.p. and psi stimuli which the exploratory study had indicated to be of interest and worthy of further elucidation.

Various aspects of this experiment have been presented on several occasions: At the 5th. International Society for Psychical Research Conference, April 1981 (Roney - Dougal, 1981a), the 24th. Annual Convention of the Parapsychological Association, August 1981 (Roney - Dougal, 1982a) ; at the 11th. International Parascience Conference, September 1981 (Roney- Dougal, 1981b). The results have been published in abstract (Roney-Dougal, 1982a), and together with the Exploratory Study in full (Roney-Dougal, 1987).

METHOD

Participants

Eight participants, five male and three female, undertook eleven sessions each. They were unpaid volunteers who were friends of the experimenter. Four were postgraduates and two were undergraduates. They were studying a wide variety of disciplines ranging from theoretical physics to social anthropology. Six of the participants had taken part in the Exploratory Study, and all had prior experience with the Ganzfeld. They were all invited to bring their own sender, but most of them left this to the experimenter. Thus, there were a variety of senders, most of them undergraduate students.

The ages of the participants ranged from 25 to 38 years old. Because the experiment took nearly a year to run, some of the participants got to know one another outside of the context of the experiment, and became, in a sense, more of a group than separate individuals. However, the experiment was never discussed with regard to specifics, such as targets, outside of the sessions.

Apparatus

The Ganzfeld technique was utilised; the apparatus was the same as for the Exploratory Study apart from the following changes:

A homogeneous auditory field was created by using a tape of Cennarth waterfalls played on a Philips tape recorder, N4307, connected to the participants' headphones via the junction box. This tape was used because the participants in the Exploratory Study had objected to the sound of the white noise, and found this far more pleasant (c.f. Stanford & Roig, 1982). At the end of the session the mentation was related image by image to a target pool containing four target themes, assigning points to each theme on the basis of similarity between the theme and the session imagery. These were placed in rank order according to the degree of similarity with the mentation, and also rated on a 0 - 99 scale.

The target tapes were played on a Philips N4418 tape recorder at a volume specified in the sender's instructions. This was connected via a decibel attenuator and junction box to the participant's headphones on s.p. sessions. The palmar skin conductance was recorded on a Washington 400 MD 2C chart recorder, and the communication signal was connected directly to one channel of this.

The Mood Reports were completed just prior to, and immediately after, every session. These were based on those used in the Exploratory Study, and had been further amended by removing those adjectives that had never been used, and substituting words that had been suggested by participants during that experiment.

The Attitude-to-Psi questionnaire was completed prior to the first session, and sealed in an envelope by the participant. The psi aspect of this was the same as those used in the Exploratory Study, and s.p. questions based on these were added.

The Witkin EFT, Part B, was completed prior to the third session. Further assessments of flexibility of cognitive style (Thilevich, 1968) were obtained using the Pitcher and Stacey (1947) Verbal Similarities Test and the Luchins (1942) Einstellung Test. The Betts QMI Vividness of Imagery Scale and the Gordon Test of Visual Imagery Control (Richardson, 1969), and the Paivio Ways of Thinking Test (Paivio, 1971) were all completed in order to assess the visual/verbal dimension of cognitive style. These tests were all completed prior to later sessions according to time available, and the participant's inclination.

Stimuli

Prerecorded verbal stimuli were used. Each target consisted of five thematically related words chosen for their high imagery and concreteness from Paivio, Yuille and Madigan (1968) and Spreen and Schulz (1966). These were supplemented with associates from Postman and Keppel (1970) and additional words from myself where necessary (see Appendix 3). Each word was recorded in such a way that they all had an identical output dB level. The five words

occurred at a rate of one per minute, and were repeated twice more in differing order, thus making a 15-minute target tape. These tapes were then compiled into target pools consisting of four tapes each, such that each pool contained four distinct themes. There were a total of 10 target pools; 40 tapes in all.

Session Design

The 11 sessions for each participant were divided into 5 s.p., 5 psi, and one baseline measure session (control). This latter enabled a measure of mood change due solely to the effects of the Ganzfeld, and control periods for the GSR, to be assessed. No target was chosen and so there was no judging procedure on these occasions. A blank stimulus tape was played during the session.

The subliminal stimuli were presented at three different levels below auditory threshold; 5dB below threshold, as suggested in the work by Henley and Dixon (1974); 15dB below threshold, as was used in the research by Zenhausern mentioned in the literature review; and 10dB below threshold, being the midpoint between the two. The white noise acted as a mask ensuring total subliminality throughout the session. At the beginning of the session, the participant put on the headphones and adjusted the white noise to a loud but comfortable level. Their auditory threshold was then assessed using the method of limits, with

a neutral word (sixteen) on a tape loop as the stimulus. The lowest positive response was used as the physiological threshold (c.f. Gordon, 1967), and the attenuator was then switched 5dB below this so as to ensure complete subliminality of the stimulus, even after habituation to the white noise.

Each person received one target tape per pool and had a different pool for each session, so that there was no preawareness of the contents of the target pools. The s.p. and psi sessions occurred in random order for each person, this order being balanced over the eight participants, so that each pool was used equally in each condition and each condition occurred equally often as session number 1,2,3, etc. This design was worked out prior to the commencement of the experiment by an independent person who placed the appropriate instructions for each session in a sealed envelope marked on the outside with the participant's number and the session number. These were sent directly to the laboratory technician who kept them in the desk in his room, and gave the appropriate envelope to the sender once the session had started. Thus, neither participant, experimenter, nor sender had prior knowledge of experimental condition, pool, or target.

Procedure

Upon arrival, each participant was offered light

refreshment and spent approximately 30 minutes discussing the experiment with the sender and experimenter. The participant then entered the Faraday chamber, settled into the comfortable chair, and completed the mood report and any other questionnaire necessary. He or she then put on the headphones, adjusted the white noise level, and had his or her auditory threshold tested as described above. The white noise was then turned off, and, after a final check on procedure, the ping-pong balls and palmar GSR electrodes were attached, and the participant was left alone in the chamber. A 15-minute relaxation tape was played, taken from a Yoga Nidhra procedure. This contained a period for self-suggestion to: "Become aware of the target."

During this relaxation period, the sender obtained the instruction envelope from the technician while the experimenter made any necessary adjustments to the skin conductance meter and chart recorder. At the end of the relaxation period, the sender signalled, by means of the communication light, to the experimenter to turn on the white noise and to start recording the participant's session mentation. The sender then put on the target tape and adjusted the target tape recorder so that during subliminal sessions his/her headphones were disconnected, and during psi sessions the participant's headphones were disconnected. During psi sessions the sender concentrated on the target words and attempted to "send" them to the participant,

slowly building up a whole picture as each word in the theme was heard. Thus the form of psi used was essentially telepathy, although clairvoyance and precognition cannot be excluded. The sender also signalled when each word was presented, providing a basis for the GSR analysis. The sender, therefore, had no knowledge of the subliminal target. During both psi and s.p. sessions the sender noted any thoughts, ideas or images that occurred to them during the session.

During the session, the experimenter monitored the participant's session mentation on the tape recorder, and made written notes of this mentation. She also noted the stimulus points signalled by the sender. At the end of the 35 - 40 minute session, the sender placed his/her record sheet back in the envelope and returned it to the technician, and returned all the equipment to normal. A mood report, word association sheet, and target pool sheet appropriate for that session was then given to the experimenter who turned off the white noise and entered the Faraday chamber. The post-session mood report was completed and the word association test given. This contained all the words in that target pool (20 words) in random order and was the participant's first conscious contact with the words. The experimenter and participant then read through the notes made of the session mentation, assigning points to the four target themes according to degree of similarity between

the mentation images and the themes. The participant then placed the four themes in rank order and rated them according to degree of correspondence with the session mentation. The experimenter did likewise. When this was done they left the Faraday chamber and the sender gave feedback as to the target, but not the session condition; this was revealed only at the end of the experiment. The monitor tape recorder was then switched off.

Some weeks later full transcripts of the sessions were typed out and sent to two independent judges, who were both psychologists and psi-conducive experimenters, one of whom had prior experience with the Ganzfeld technique. They ranked and rated these transcripts in a manner similar to the participant according to degree of similarity with the target themes.

RESULTS

1)Cognitive

The ratings of the target pools were assessed as for the Exploratory Study. The rank scores were summed, and p-values were found from the Solfvin, Kelly and Burdick (1978) tables. They were analysed to determine whether the target had been chosen overall greater than chance expectation, whether the s.p. or the psi sessions had been chosen above chance, and whether there was any difference

between these conditions. Equivalent analyses were performed for each participant's score other than the latter analysis as there were not enough data points for this (see Table 5).

Figure 5
Histograms of Rank Scoring

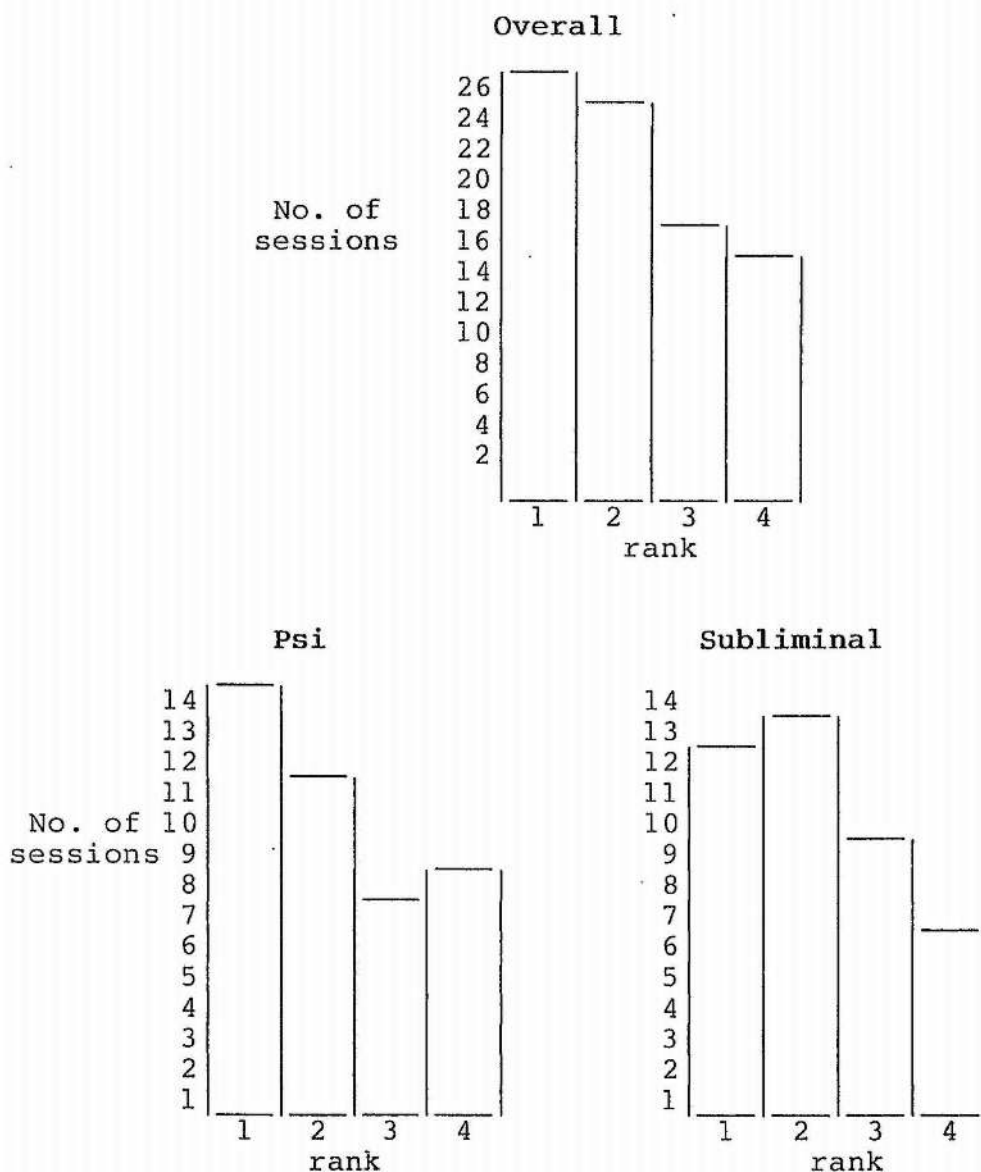


Table 5

COGNITIVE AWARENESS OF THE TARGET

Experimental Condition	No. of hits*	No. of ^{Miss} sess.	Sum-of ranks	p (1-tail)	Rating z-score	t	p (1-tail)
Overall	50	80	178	.016	+.225	2.487	.007
Psi	25	40	89	.069	+.234	1.746	.04
S.p.	25	40	89	.069	+.217	1.736	.04

Participants

1	9	10	16	.007	+.644	7.603	.0001
2	4	10	29	n.s.	-.091	0.318	n.s.
3	4	10	29	n.s.	-.276	0.941	n.s.
4	4	10	25	n.s.	+.013	0.045	n.s.
5	5	10	24	n.s.	-.045	0.151	n.s.
6	8	10	18	.033	+.536	2.02	.035
7	6	10	22	n.s.	+.237	0.908	n.s.
8	10	10	15	.003	+.788	5.589	.0001

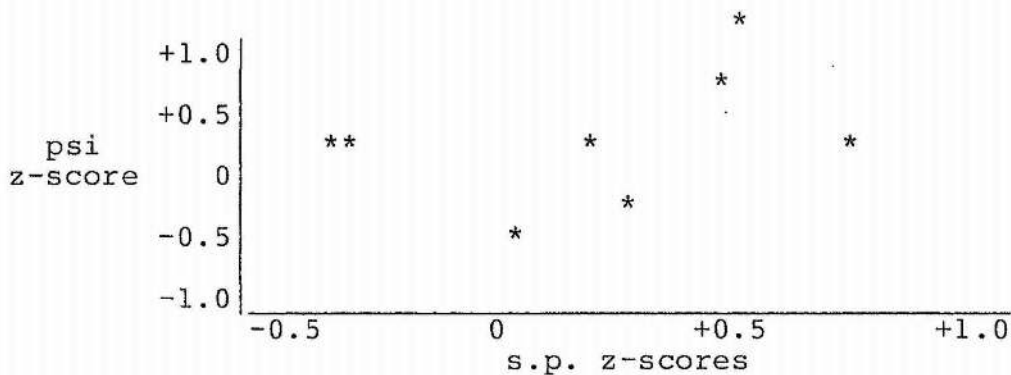
*Ranks 1 and 2 are considered to be hits, for descriptive purposes only.

In Table 5, the overall row is a description of the experiment as a whole, combining both psi and s.p. scores (c.f. Braud, 1981). Thus, irrespective of condition, the target was chosen correctly to a significant degree on both the sum-of-ranks and the rating analyses. Breaking this overall score into its component parts of s.p. and psi, it is found that both conditions are statistically significant above chance using the rating data, but only suggestively so with the ranking data, the sum-of-ranks being one digit over the significance point! It is logically nonsensical to say that the experiment is significant overall, but that neither psi nor s.p. were present, especially as the hit rate remains constant at 62.5%, so the nonsignificance of the ranking data must be considered lack of sensitivity of that method. The very slightly greater "t" of the s.p. condition is due solely to a smaller variance, there being a predominance of ranks 2 and 3 in the s.p. condition, with a predominance of ranks 1 and 4 in the psi (see Figure 5).

The correlation between the two experimental conditions is suggestively positive, $r = .572$, $p = .07$ (see Figure 6). The lack of difference in the scoring on the two conditions, and the suggestively positive correlation, leads to the conclusion that under these conditions, at the level of cognitive decision (lexical choice), the two phenomena are somewhat comparable. As clairvoyance and precognition could have been used to identify the targets on

Figure 6

Correlation between S.p. and Psi Rating Scores



both the psi and the s.p. trials, these can be considered a baseline for both conditions. This leaves the question of why a physically present subliminal signal did not emerge with any greater clarity than a telepathic signal. Since s.p. is considered by many to be a "normal" everyday form of perception applicable to the human race as a whole, this finding certainly suggests that the same is true for psi perceptions.

A one-way repeated measures ANOVA of the 3 s.p. output dB levels showed no significant difference between them. The 10dB output volume alone reached independent statistical significance above chance expectation: sum-of-ranks = 27, $p = .036$; rating $t = 5.102$, 13df, $p = .001$). Both analyses are one-tailed. This suggests that a 10dB volume level below threshold may be an optimum stimulus level in work of this kind.

A breakdown of each participant's psi and subliminal scores is given in Table 6.

Table 6

PARTICIPANT' PSI AND SUBLIMINAL TARGET SCORES

		No.of hits	No.of sess.	Sum-of ranks	p (1-tail)	Rating z-score	t	p (1-tail)
S1	Psi	6	6*	8	.007	+.707	8.450	.0001
	S.p.	3	4	8	n.s.	+.549	3.236	.02
S2	Psi	3	4*	10	n.s.	+.262	0.600	n.s.
	S.p.	1	6	19	n.s.	-.326	0.804	n.s.
S3	Psi	1	5	17	n.s.	-.531	1.533	n.s.
	S.p.	3	5	12	n.s.	+.078	0.178	n.s.
S4	Psi	1	5	16	n.s.	-.303	0.799	n.s.
	S.p.	3	5	9	.199	+.329	0.694	n.s.
S5	Psi	3	5	10	n.s.	+.225	0.577	n.s.
	S.p.	2	5	14	n.s.	-.316	0.622	n.s.
S6	Psi	3	5	10	n.s.	+.275	0.515	n.s.
	S.p.	5	5	8	.055	+.796	4.710	.005
S7	Psi	3	5	11	n.s.	+.245	0.499	n.s.
	S.p.	3	5	11	n.s.	+.228	0.707	n.s.
S8	Psi	5	5	7	.021	+1.00	8.990	.0001
	S.p.	5	5	8	.055	+.574	2.357	.04

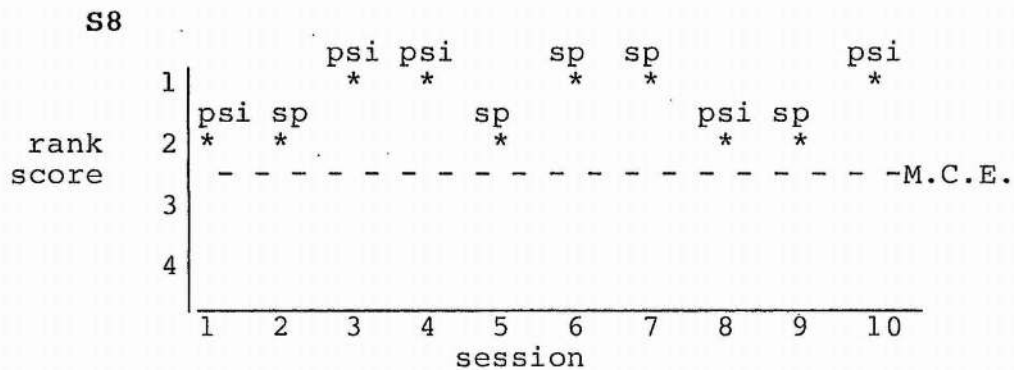
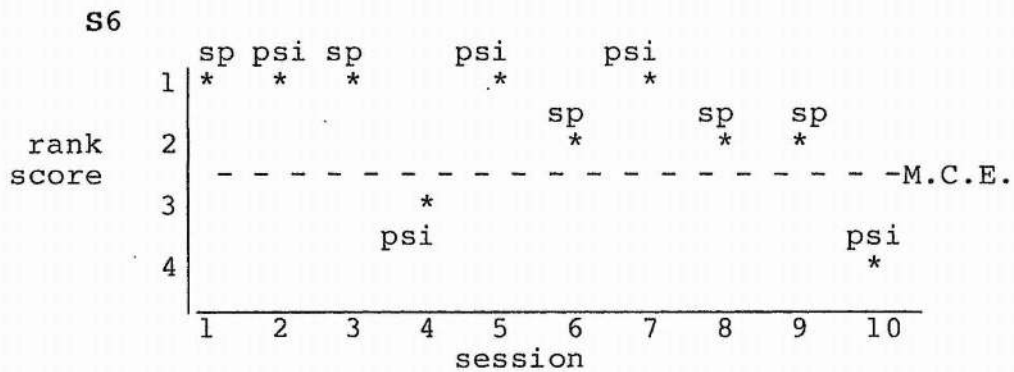
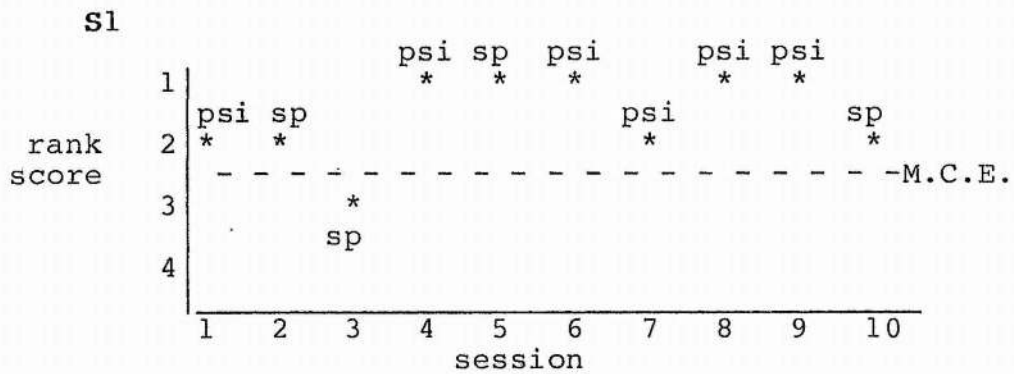
*Sender error caused unequal number of psi and s.p. sessions

Once again the rating data contain more information than do the rank scores. The three participants who score overall significantly greater than chance in Table 5 can now be seen to be primarily high psi hitters, the exception being S6 who scored significantly on his s.p. sessions only. S3 comes suggestively close to significant psi-missing although I wasn't testing for this in this experiment; S3 was Judge 3 in the Exploratory Study.

Thus, although there is no overall significant difference in scoring between the two phenomena, there are individual, though nonsignificant differences. Five of the participants scored better on the psi sessions than on the s. p. sessions. Of the three who scored best on the s.p. sessions, two are what I describe later as "learners" having had no, or little, experience of spontaneous psi. In order to better understand these raw scores they have to be reconverted back into the experiences of the people who produced them. Thus, I shall present figures detailing the patterns of hits and misses of each participant.

The most appropriate place to start a description of the participants is with those three people who scored independently significantly - - the "hitters" (see Figure 7).

Figure 7
Scoring patterns of the "hitters"



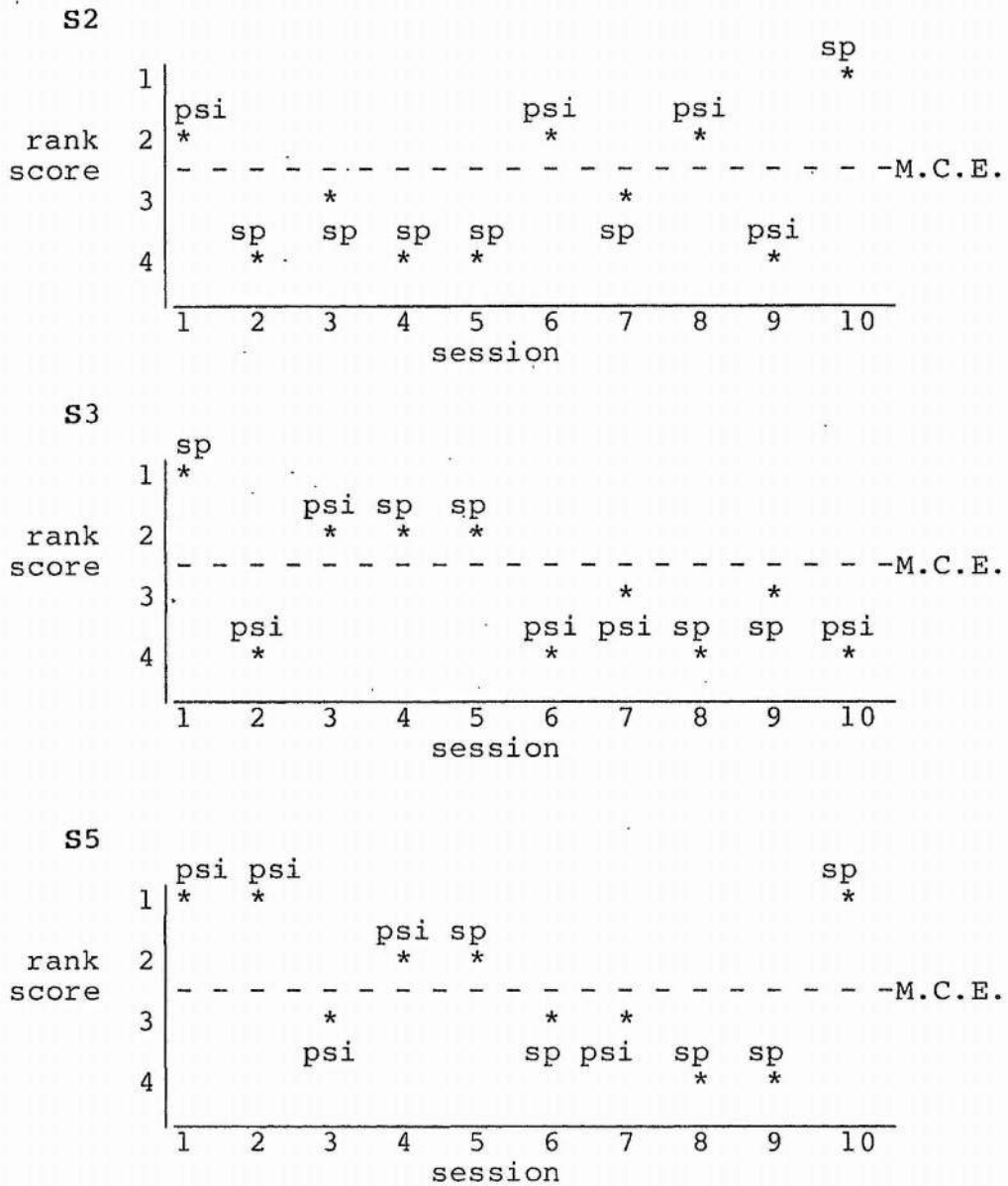
All three are "super-sheep", according to their attitude questionnaire answers, and S1 and S8 have both experienced a large number of spontaneous psi occurrences.

S1 and S8 have already been mentioned in the Exploratory Study, S8 being the participant who scored the target last on every session, and S1 being the participant who scored best of all with 3 hits in the 4 sessions. S6 is rather different in that he has researched into healing and has taken a number of "mind-training" courses, but has had little experience of spontaneous psi. This difference shows up in the session mentation; that of S1 and S8 is dream-like, bizarre, with plentiful imagery, whereas S6 meditated, giving at most a dozen images per session (see Appendix 4). Thus, S6 is an example of a "trained" mind. achieving results almost equivalent to those with "natural" psi abilities. It should be noted that S6 scored better with the s.p. stimuli, though not significantly so, whereas S1 and S8 scored relatively better with the psi stimuli.

The patterns of those who missed the target most of the time are given in Figure 8.

Of these three participants, S2 is a "goat", who took part in the Exploratory Study and missed the target on every session, whereas S3 and S5 are "professional" psychics in that their work involves the use of psi abilities. S2's scoring pattern is both instructive and amusing in that he had a run of misses equivalent to his scoring pattern in the Exploratory Study. However, at the end of session 5 he met another participant, S3, who informed him of the significance of his missing. Thereafter, he scored precisely

Figure 8
Scoring patterns of the "missers"

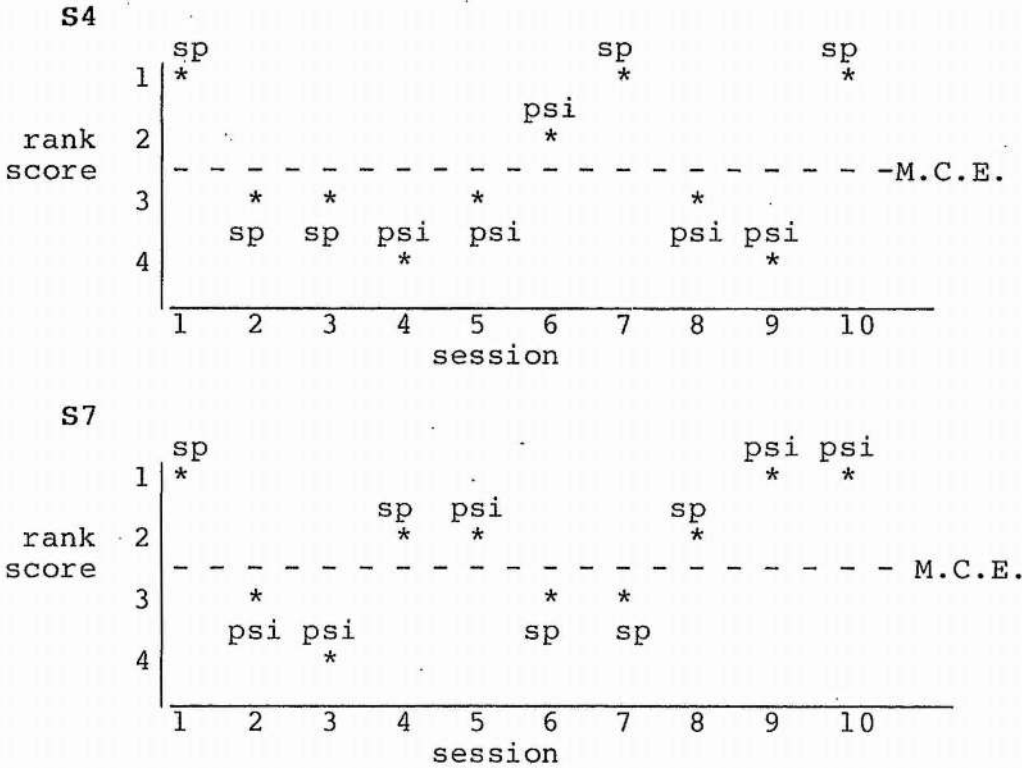


at chance level, hitting on one session and missing on the next!

The scoring patterns of S3 and S5 are remarkably

similar; both started by scoring reasonably well with only one miss each in the first five sessions. The shift to consistent missing in the latter half of the series is ascribed by both participants to motivational problems because rank 2 hits simply weren't good enough for them, and once they started missing they were unable to break the pattern (c.f. Robinson, 1982).

Figure 9
Scoring patterns of the "learners"



The "learners", whose scoring patterns are depicted in Figure 9, are designated as such solely on the basis of

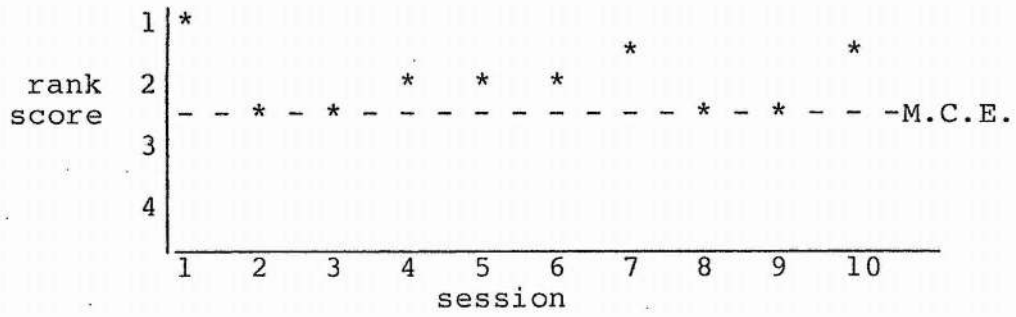
their responses to the attitude questionnaire. S4 has a scoring pattern very similar in some ways to that of S2, the goat, whom in some respects she resembles, being very doubtful about her ability to hit the target, and having at the time some uncertainty as to the reality of psi. S7, on the other hand, is very interested in parapsychology, but has had very little spontaneous psi experience and no mental training. It is worthy of note that one of the judges (see section: Independent Judges) scored his psi transcripts independently significantly above chance, suggesting that the stimulus related material was present in his session mentation and that he had difficulty at the judging stage of the procedure, presumably from lack of experience.

What is striking about all of these scoring patterns is that there is so very little difference between the two experimental conditions. Those who are "hitters" score well under both conditions; those who are "missers" tend to miss both types of stimuli, although there are subtle differences which I shall elaborate on in the discussion. The scoring pattern over the whole experiment is shown in Figure 10. There is no clear decline effect, as was evident in the Exploratory Study. Instead, both overall and under the two conditions, the scoring is at or just above chance level. There is slightly greater variability in the s.p. sessions, but not significantly so.

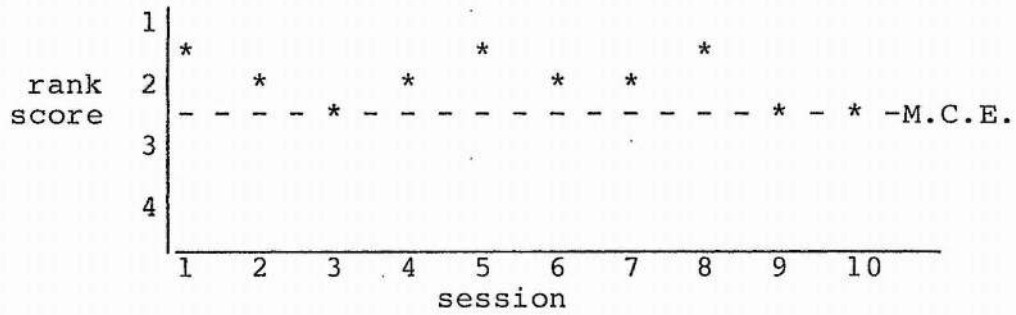
Figure 10

Average scoring over sessions

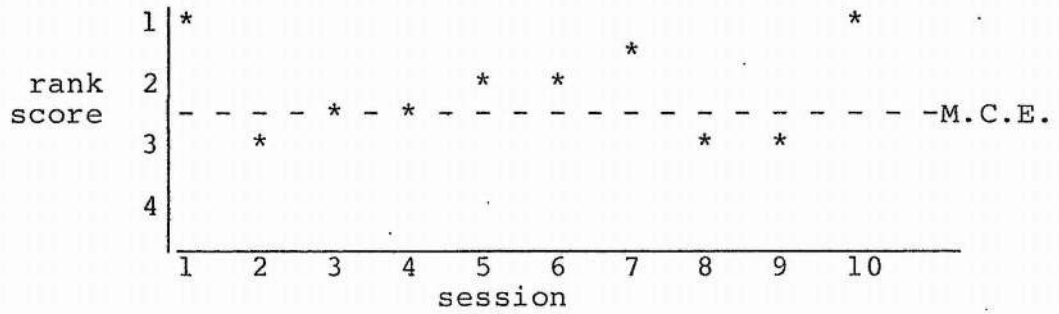
Overall



Psi



Subliminal



2) Psychological Correlates of Target Scoring

All analyses of the various personality questionnaires were performed using the SPSS Scattergram programme (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975), which utilises the Pearson Product Moment Correlation test of significance. The participant's rank score was used, both for overall target score and, on a post-hoc basis, for each of the experimental conditions. The results are presented in two parts: Table 7 presents those results which are confirmatory of the Exploratory Study, and Table 8 presents further exploratory analyses.

Table 7
CONFIRMATORY PSYCHOLOGICAL CORRELATIONS

Correlation (n=8)	Pearson r	p
Attitude and overall rank score	.623	.05
Attitude and s.p. rank score	.655	.04
Attitude and psi rank score	.357	.19
Attitude and the \bar{A} s Inventory	.903	.001
Attitude (diff. from median) and Witkin EFT	.596	.059
Rank score (diff. from median) and Witkin EFT	.208	.31

Once again, as in the Exploratory Study, the absolute values of the deviations from the median are

correlated with the Witkin EFT. With the exception of the Witkin and rank score correlation, all of these results are remarkably similar to those found in the Exploratory Study, showing in the first four cases even stronger relationships.

The most important parameter to indicate the overall level of scoring that a person will exhibit in an experiment of this type is attitude. This confirms the descriptive findings discussed in the previous section.

This variable of attitude correlates very significantly with the As Inventory which measures 9 "personality" factors relating to susceptibility to hypnosis. As part of the exploratory analyses, each of these subscales were correlated both with rank score and with attitude. Of the other psychological tests administered, not everybody completed the Luchins (1942) Einstellung Test, thus analysis of the relationship with cognitive flexibility is limited to the Pitcher and Stacey Test (1954). As regards the visual/verbal dimension of cognitive style, the Betts QMI showed no relationship with rank score, and the Gordon test (Richardson, 1969) gave no information whatsoever because all the participants scored at an identical level. The Paivio Ways of Thinking Test (Paivio, 1971) was more informative. Thus, Table 8 contains correlations from the As subscales, the Pitcher and Stacey test, and the Paivio Ways of Thinking test.

Table 8
EXPLORATORY PSYCHOLOGICAL PARAMETERS

Correlation	Pearson r Overall	p	Pearson r S.p.	Pearson r Psi
Rank score and:				
As Scale A	.750	.016	.768	.448
As Scale B	.645	.042	.670	.381
As Scale E	.459	.126	.000	.612
As Scale H	.440	.138	.423	.269

Attitude and:				
As Scale A	.926	.0005		
As Scale B	.956	.0001		
As Scale D	.538	.085		
As Scale H	.680	.032		

Pitcher & Stacey and:				
Rank score	.384	.174	.494	.145
Witkin EFT	.362	.189		
Paivio Verbal and:				
Rank score				
(diff. from median)	.630	.047	.446	.051
Attitude				
(diff. from median)	.600	.058		

Considering first the As Inventory, Scale A is a measure of experiences of spontaneously occurring altered states - - "a fading of generalized reality-orientation", (As et al., 1962, p.62) and is the clearest predictor overall of target score. It is also strongly correlated with the person's attitude. Likewise Scale B correlates highly with both rank score and attitude. This scale is concerned with "tolerance for logical inconsistencies" (As et al.,

1962, p.62), and so is clearly related to attitude towards psi. The only other significant correlation to emerge is that of Scale H with attitude. Scale H is a measure of "peak experiences" (ibid.), and is consequently concerned with experiences similar to, but more extreme than, those measured by Scale A. Scale E is a measure of willingness to relinquish ego-control, and Scale D is concerned with the ability to exclude distracting stimuli, to cut oneself off from the environment. Both of these dimensions are sometimes mentioned as possibly being of importance in free-response experiments (see, e.g., McConnell, 1983), but in this experiment no significant correlations emerged, although the correlations are sufficiently strong to merit further investigation.

The cognitive flexibility test (Pitcher and Stacey) did not correlate significantly with either rank score or the Witkin EFT. However, at a subjective descriptive level, this test was very interesting, and further work exploring this dimension is definitely recommended.

The Paivio Ways of Thinking Test indicated a possible relationship with both rank score and attitude in that the most extreme scoring and the most extreme attitudes were related to the person having a low level of verbal thought processes. These results are only suggestive, indicating that the important factor might not be the possession of high imagery abilities, but rather having a

low level of ongoing verbal thought processes. Thus, a nonverbal thinker does not necessarily have high imaging abilities, as is indicated by the lack of a correlation with the Betts QMI. There are ways of thinking other than the usual visual/verbal dichotomy.

3) Physiological Data

A continuous Galvanic Skin Conductance record was obtained throughout each session. For analysis, a 10-second epoch prior to, and just after, each stimulus point was used in order to determine whether or not there was a skin response to the stimulus, as follows: The basal resistance level at the stimulus point (Sp) was measured, and the mean resistance level for the 10-second pre- (A) and post-stimulus (B) periods determined. These scores were converted into conductance scores. The difference between the pre-stimulus period (A) and the stimulus point (Sp), and the difference between B and Sp were then obtained, and the two values summed. This created a trend score which indicated the extent to which the skin conductance had changed direction:

$$\text{Trend Score} = (\text{Sp} - \text{A}) + (\text{Sp} - \text{B})$$

There were 15 stimulus points for each session and so the trend scores were summed and averaged for each session

giving a total of 88 scores, which were then analysed to determine the effect of the experimental condition using a one-way repeated measures ANOVA. Equivalent analyses were done using the basal resistance level scores for the stimulus point alone. The results are presented in Table 9.

Table 9
SKIN CONDUCTANCE CHANGE AT STIMULUS POINT

Participant	S.p. (μ mho)	Psi (μ mho)	Control (μ mho)
S1	+13.48	+ 1.17	+12.66
S2	-60.13	+ 6.45	-46.13
S3	+ 7.19	+23.56	+ 5.41
S4	+26.63	+32.92	-99.0*
S5	+ 0.003	+ 2.28	+ 0.39
S6	+ 3.49	+ 7.04	- 1.00
S7	-36.05	- 8.77	-79.4
S8	+27.82	+20.14	- 2.08

Total	- 2.20	+10.60	-26.14

N.B. + = increase in conductance (more sweat)

* Owing to some very low basal levels some conductance scores were disproportionately high, and in these cases were "corrected" to 99.0.

These trend scores give an $F(2,14) = 3.44$, $p = .06$, one-tailed, which suggests that the participants may have been responding to the stimuli at a physiological

autonomic nervous system level, although this finding is suggestive only. An equivalent analysis of the basal resistance level, which measures the overall tension - relaxation level of the participant, gives $F(2,14) = 7.65$, $p = .01$, one-tailed. This suggests that although individual responses to the stimuli are not consistently present, the overall ambience of the participant is affected by the experimental condition, i.e. whether there are psi, s.p. or no stimuli to become aware of.

Related t-tests were performed to ascertain a comparison between the three experimental conditions with the following results:

Psi and control: $t = 2.217$, 7df, $p = .03$, 1-tailed;

S.p. and control: $t = 1.504$, 7df, $p = .087$, 1-tailed;

Psi and s.p.: $t = 1.443$, 7df, $p = .095$, 1-tailed.

Thus, in contrast with the findings in the Exploratory Study, the psi sessions indicate a greater physiological response than do the s.p. sessions. Most s.p. research involving physiological responses uses highly emotional negative target material, as in the Exploratory Study. It is possible that the lack of a significant response to the s.p. stimuli could be due to the use of pleasant stimuli. An examination of the signs of the participants' scores shown in Table 8 indicates that this

lack of significance is due primarily to two individuals giving the s.p. scores a disproportionately high variance, since these two individuals exhibited highly negative skin conductance changes.

The data was further analysed to ascertain whether there was any significant difference in the "hit" and "miss" sessions for both the psi and the s.p. conditions. For this analysis, a Kruskal - Wallis ANOVA was used, owing to the imbalance in the number of hits per participant. This analysis showed no significant difference between the hit, miss and control sessions in terms of physiological response to the stimulus (psi: $H = 4.314$, 2ldf; s.p.: $H = 3.65$, 20df).

4)Independent Judges

The two independent judges ranked and rated the participants' session mentation transcripts against the target pool for that session. The data were analysed in the same way as for the participants (see section: 1) Cognitive). The results are given in Table 10.

The results from Judge 1 closely match those from the participants themselves, apart from the nonsignificance of the s.p. sessions. There is a nonsignificant difference between the two experimental conditions: $t(7) = 1.543$, $p = .18$. Judge 1 scored overall positively for all the participants except S2 and S5, and obtained overall positive

Table 10
JUDGES' SCORING OF THE TARGETS

Condition	No.of hits	No.of sess.	Sum-of ranks	p (1-tail)	Rating z-score	t	p (1-tail)
<hr/>							
Judge 1:							
Overall	47	80	179	.020	0.217	2.49	.017
Psi	24	40	87	.038	0.311	2.26	.015
S.p.	23	40	92	.145	0.124	0.97	n.s.
<hr/>							
Judge 2:							
Overall	41	80	191	.198	0.053	0.55	n.s.
Psi	21	40	94	.218	0.038	0.26	n.s.
S.p.	20	40	97	.363	0.068	0.48	n.s.

psi scores for all the participants. Why Judge 2 scored nonsignificantly is not clear, other than that he has not had previous experience at judging Ganzfeld mentation. Judge 2 scored overall positively only for S's 2, 6, 7, and 8. He scored surprisingly well with S7, obtaining a z-score for the psi sessions of 0.749, $p = .01$, with four rank 1 hits.

DISCUSSION

This experiment is methodologically very different from the currently accepted norm in that it is an intensive study of eight people spanning a whole year of experimentation. I have attempted to be global in my approach, covering every possible aspect. Thus there is a vast quantity of data, only some of which has been reported here. This is, therefore, an amalgam of the single "super-star" type of experiment, and the more traditional group experiment.

The most important point to note from this experiment is the lack of a significant difference in the scoring rates of the two types of phenomena. It must be stressed that, although I had not made a specific hypothesis, and despite the lack of a significant difference in the Exploratory Study, I still expected the subliminal sessions to show a stronger effect than the psi sessions, because s.p. is a purely sensory phenomenon - especially with the GSR. To begin a preliminary understanding of this lack of difference between the two phenomena, I must once again turn to the "descriptive science" (Schumacher, 1978) viewpoint, because working with these participants closely over a period of three years - for some of them - allowed me to gain far more insight into the psychological processes at work than can possibly be expressed by statistical formulations.

Psi Achievers

Altogether five of the eight participants scored better on the psi sessions. There were two people who scored independently significantly on the psi sessions, S1 and S8, both of whom have a history of psi experiences in every day life, though neither of them "use" this ability in a "professional" capacity. They have both already been mentioned in the Exploratory Study, in which S1 scored a 75% hit rate and S8 a 100% miss rate, which in itself is by no means a chance performance! There was also considerable trouble recording S8's session mentation, both in the Exploratory Study and in this present experiment, because the tape recorder frequently malfunctioned during her sessions. The tape of her mentation always sounded perfectly alright when monitored during the session, but on playback would emit whines, hums, whistles, and on two occasions backward voices and laughter. On these occasions her own voice became completely inaudible. This malfunctioning was only discovered by me at a later date when I came to transcribe the session. Recording done with other participants prior to, and after, her sessions on the same tape were always absolutely fine, so this effect was not an inherent fault in the tape recorder or the tape - - just one of the problems of working with people who have a life history of psi effects!

The independent judges found the incredibly

imaginative mentation of these participants difficult to judge, although Judge 1 eventually cued in and obtained hits for the last six sessions of S1, indicating that increased familiarity with the mentation style permitted the target related imagery to emerge with greater clarity. (Could it be that when we are looking for visual/verbal/imagery correlates with psi scoring we should instead be looking for strength of imagination?) This suggests that one of the reasons for the significance of S1 and S8's scoring is an enhanced level of familiarity with their own mentation and the ways in which the psi-related material emerges.

It appears that correct scoring of the target in a Ganzfeld experiment is a two-stage process. The first stage is the receptive period during the Ganzfeld experience in which the person has to be passively aware, allowing information from the subconscious to surface. This receptive stage is basically primary process in its structure. The second stage is the judging process whereby the person must bring the logical, analytical part of his or her mind to bear on the problem of translating the session mentation in terms of the four possible targets in the pool, so as to ascertain which target is most clearly related to the mentation. For a person to be successful at this stage, he or she must be well acquainted with the way in which his or her mind works and not at all defensive. While the information is being processed subconsciously it more

easily by-passes the normal defence mechanisms (Dixon, 1971), and so it is primarily when the conscious mind is brought in to assess the mentation that the defence mechanisms come into operation. We can assess these defence mechanisms with psychological tests, and this in part is what Martin Johnson is doing with the DMT experiments (e.g. Johnson & Haraldsson, 1984). Those who are not at all defensive, have a completely open mind at the receptive stage, and experience with the way in which their mind works at the judging stage, should be successful in a Ganzfeld experiment. S1 and S8 are good examples of this. They were both very good at applying the point-by-point judging procedure to their session mentation, a procedure which many of those who missed the target found difficult.

In this study both s.p. and psi appeared to be subject to this process, and thereby to similar psychological problems thwarting a clear transmission of the signal. It is possible, therefore, that a reason for S1 and S8's enhanced psi score was due to the "set" of the experiment being primarily towards psi, enthusiasm for scoring well on the s.p. sessions taking a second place. Although at a conscious level nobody ever knew the experimental condition until the end of the experiment, differential motivation could have had an effect with participants as "sensitive" as these two.

This reasoning is most apparent with S5 who stated

several times both before and during the experiment that he only wanted to "do well" on the psi sessions. And he did score better on the psi sessions, although primarily by a depression of his s.p. scores to a below chance level! This possible motivational factor is, however, confounded in this case by a second problem. S5 is a "professional" psychic, who we have already encountered in the Exploratory Study, and therefore had a strong need to be seen to do "well". It has been noticed by other researchers that "too much motivation spoils the psi" (Weiner, 1983, p.354), and this is definitely so with this participant. Rank 2 hits just were not good enough for him, and then when once he started to miss the target altogether, he was unable to break the trend. He remarked later that the experiment began to be a "chore" for him, and he was also waiting for his control session to be over, which for him came near the end of his series. It is interesting to note that he showed a similar pattern of scoring in the Exploratory Study.

S2 also scored relatively better on the psi sessions, but the explanation for this is totally obscure, since, as mentioned in the Results section of the Exploratory study, his prime and stated motivation was that of a "goat", and his scoring pattern fully corroborates this. It is just possible that the perceptual defence consistent with his attitude found its expression most readily with the subliminal stimuli, as in the case of the

"learners".

Although this might sound as if I'm trying to find meaning in anything, all these points are corroborated by the various personality questionnaires which the participants did, and so are not purely subjective impressions from our three years working together.³

Subliminal Achievers

There were three participants who scored relatively better on the s.p. sessions than on the psi ones. Of these three, S6 scored independently significantly at the .01 level above chance on the s.p. sessions. He differs from the other two above-chance scorers as described earlier in that he has little experience of spontaneous psi. However, like them, he was very good at judging his session mentation according to the judging procedure used. The independent judges also found his transcripts relatively easy to judge due to the sparsity of images and the resultant decrease in "noise". In fact, the first of his two misses was judged correctly by both of the judges, suggesting that this miss might have been due to factors at the judging stage of the process rather than at the receptive stage. It is not easy to see why this participant scored relatively better on the s.p. sessions other than that there is something inherently easier about becoming aware of s.p. stimuli for those who are open, and yet relatively naïve with regard to psi.

This suggestion, besides relating to remarks concerning S2 above, finds a certain amount of corroboration in the scoring pattern of S4 who also scores relatively better on the s.p. sessions than on the psi. She was not only naïve with regard to psi, but evinced considerable doubt and fear about becoming aware of the target. For example, in session 4 she spent 10 minutes talking about how she had just given up drinking alcohol, and how strange it was to go out to the pub and watch all her friends. Yet, when she saw the target pool and one of the themes concerned alcohol and pubs, she ranked it last saying that: "It was too much of a coincidence"! This was a dramatic lesson to her as that theme was the target, and she realised the degree of defensiveness that she was exhibiting. Thereafter, she started trying to judge the targets according to the judging procedure, a process which she had found very difficult previously. Simultaneously, her scoring improved. The pattern here is one of a learner who has little experience with psi and is quite threatened by the ability to become aware of the target, invariably missing on the session after a hit. It is just possible that s.p. is relatively easier in this situation than is psi.

The only other person to score relatively better on the s.p. sessions than on the psi was S3 but, as with S5, any possible rationale for this is confounded by the motivational and ego problems mentioned earlier, owing to a

self-perceived "professional" status .

"Gremlins" in the lab?

One aspect of researching into psi processes, which other investigators have noticed, is that there are frequent periods which can best be described as "runs of good. luck", or "runs of bad luck". This was very noticeable in this experiment. At this stage a description of this phenomenon can be no more than an exploratory exercise, so I shall merely describe as accurately as possible the patterns that occurred.

The experiment started well; in the first four weeks there were five hits and two misses, both of these misses being those of S2, the "goat", and so were more or less "expected". As a result everyone felt very pleased with themselves and the experiment was seen as going well. Then, on November 21st, 1979, came the first of the "bad" runs and EVERYONE who came into the laboratory in the next two weeks missed the targets, namely S1, S2, S3 and S5. During this time, there was a lot of trouble with the tape and GSR recorders, the senders made silly mistakes, and the general feeling was that the "bad luck" was out of our control - - that there were "gremlins in the lab". This was finally broken by S1 on December 6th., and three more hits followed before the Christmas break.

The question to be asked is: "Why did S1 miss the

target on this occasion when he hit the target on every other session?". This is not a "chance" miss (if there is such a thing); he is perfectly capable of becoming aware of the target and this was a subliminal session - - due to a sender error! Similarly the first of S6's two misses was in a second "bad luck" run in July 1980 when there were five misses in a row. As stated before, this miss was judged correctly by both of the independent judges, and as S6 was very good at judging his mentation normally, it seems that this miss must be due to factors other than inability to become aware of the target.

Overall, during the year we had 3 "bad runs" in which 43% of all the misses occurred, and 6 "good runs". These could be seen to be merely chance, but the fact that hitting and missing comes in runs at all is of interest since, on a random basis we would expect a far greater clustering of hit rate around 50% whereas it fluctuated from an 80% hit rate to a 100% miss rate. Further we have to remember that even the consistent hitters produced a few misses, and these were all located in the bad luck periods. These misses appear in this context to be a "reflection" by the aware person of the outside pattern, whereas most misses are a projection of the participant's own fears, defences etc. The scattering of misses in an otherwise "good run" are a result of individual's defences and so differ considerably in pattern from the negative runs.

There were two points where the otherwise reasonable scoring levels fell off - in April and in September. These appear to be "fatigue points", where a break was needed. This fatigue effect seems to be similar to the earlier finding that it was important not to run two sessions on any one day, except here it applies over weeks rather than days.

I am not at this point going to offer any possible explanations for these scoring patterns that were noticed - my task at present is merely to bring this effect to your attention, as I am sure it is a common-place phenomenon which has not received the attention it deserves. So many people report their experiments as non-significant without saying anything about the background patterning. It seems to me that so-called non-significant chance results are often composed of behavioural patterns that are anything but random. Each session in a free-response experiment is a composite of the individual pattern and the overall pattern. The overall pattern is a synthesis created by the sender, experimenter and receiver, and it is possible that it is through examination of such patterns that we can finally clarify the question of experimenter psi, psi-missing etc.

An Examination of the Misses

I feel that we can learn as much about the processes of psi perception through the misses as we can

from the hits, in much the same way that studies of perceptual defence elucidate mechanisms involved in subliminal perception. So often, one reads reports where the misses are mentioned only in such terms as: "For some reason, psi was not present at this session", with no attempt being made to find out why it was not present. People just seem to accept its elusiveness and search for a replicable experiment. I feel that the elusive nature of psi is to be found in the various psychological parameters that an examination of the misses elucidates.

The best place to start this examination is with S2, the "goat", a rat-psychologist. As well as his stated disbelief in psychic phenomena he also expressed scepticism concerning subliminal phenomena, and claimed never to have any dreams. The most noticeable fact about his sessions was the inconsistency of his mentation style (see Appendix 4); in some sessions he exhibited a vivid imagination and talked throughout the session, in others he said as little as S6, these latter being towards the end of the series. In some sessions his state of consciousness appeared to be unaffected by the Ganzfeld in that his mentation was composed of associations, thoughts of work he had to do, memories about recent events, etc., a type of thinking that we called "wittering". The observation that most of his misses are due to personal defensiveness rests largely on the fact that at least one judge perceived the target

correctly from his transcripts on 8 out of the 10 sessions. On the whole, however, the judges found his transcripts difficult to judge, primarily because of the inconsistency of his mentation style, and also because of the quantity of "noise" in his transcripts.

A second point was that when he did the word association test to the words in the target pool at the end of the session, images that had occurred during the session would occasionally be associated to the target words. He always gave very bizarre word associations. A good example of this process is that of session 3 in which he missed the target, whereas Judge 2 ranked it first. In this session he talked several times about ice, icebergs, the Titanic, Alaskan permafrost, etc., and his word association to the target word "adventure" was "cold". Further, his association to the target word "smugglers" was "gallows", and during the session he had an image of boys in prison, Roman soldiers, Steerpike with a knife in his hand, cannon projectiles, and, most significantly, Albert Pierpoint, the last of the British state executioners, who used to execute criminals by hanging them on the gallows. Although there is no direct connection between these images and the target words, the word associations provide a very revealing link, especially coupled with the knowledge that he grew up in Belfast, this target theme therefore being more emotional for him than for most people. We must never forget in free-response studies

like the Ganzfeld, that we are dealing with areas of the mind that tend to work in global, symbolic, and essentially dreamlike form. I found that only about 12% of the time was there a direct representation of the target in the person's mentation; otherwise it was connections like the example above that gave the clue as to the target.

The transcripts of S2, who consciously denied any possibility of awareness even of subliminal material, were abundant in such connections. Most of these he denied when judging his transcripts, possibly in order to reduce any cognitive dissonance he may have felt at being able, at one level of his mind, to perceive the target. He was very uncomfortable with the judging procedure, talking extensively about past experiences that his images related to and rarely trying to fit the images to the target words. This attitude did change over the series, so that by the end he was producing few images and was trying to judge them according to protocol. It was then that he scored 3 hits in 5 sessions.

The other person to miss as extremely as S2 was S3, who is almost his polar opposite. The reasons behind her negative scoring are very instructive for us all. She is a "trained psychic" who has undertaken other psi experiments and scored significantly above chance, although her attitude questionnaire answers show her to retain some doubt about undertaking laboratory experiments. In this case she

started well, her miss on session 2 being part of the "gremlin" series already mentioned so it did not concern her too much as she perceived it as not being "her fault", but outside of her, so to speak. She then got two rank 2 hits which she considered to be unsatisfactory as she wanted to get rank 1 hits all the time. She did not come back into the lab. for over a month after this, and when she did return her usual sender could no longer come, so she had a stranger who left directly the session finished. The technician then gave her incorrect feedback at the end of the session, telling her she had got a rank 4 miss, instead of the rank 2 hit which she had in fact got. (This error was only discovered at the very end of the experiment when I began the analysis.) This upset her very badly and from then on she consistently missed the target. The incorrect feedback at session 5 seemed to break her already shaky confidence; her need to be seen as psychic resulted in strong ego-involvement, which caused motivational and attitude problems, and once she had started a negative trend she found it incredibly difficult to break - - to the point where she was saying: "The way I am at the moment, the one I mark as 4 is probably the target." - and it was!

Another source of dis-ease was the judging procedure which she did not like, in common with S2 and S4. All three show signs of defence at the judging stage. With S3, of her five misses, both the judges missed only one

session, and two sessions were ranked correctly by both judges, suggesting that the target related mentation was present in her transcripts. I know I am not the first to have found this "high variance" in super-sheep; there are many remarks concerning it in the parapsychological literature. What is worth noting here is the constancy of the hitting in the first half of the series, and the missing in the second half, which validates these subjective observations. This is not random hitting and missing; there is a clear shift in pattern from the first to the second half of the series which reflects the ongoing psychological aspects.

S5, already mentioned above, exhibits a pattern of scoring very similar to that of S3, and in many ways is a very similar case. He, too, had a reputation to live up to, with the implicit ego problems and fear of "doing badly". This is a problem that none of the three hitters had to contend with. For them, the experiment was fun, to be enjoyed and also very interesting. I feel that this is a VERY important point. If one's motivations are other than those of enjoyment and curiosity, problems seem to occur. The emotional effect that ego involvement has on a person when undertaking a series as long as this with immediate trial-by-trial feedback cannot be over-emphasised.

I hope that I have given some indication of the insights to be gained from an examination of the misses. I

fully appreciate that I may be making the conceptual error described so well by Weiner (1983) of motivation as the universal container able to explain why it occurs, why it does not, and why it becomes distorted into negative courses. However, these descriptive notes concerning the psychological processes at work behind the objective statistical scoring levels are notes that I made whilst the experiment was happening, and which I have discussed at length with the participants concerned. They are offered here solely for the practical benefits to be gained from such insights, and for the possibility of hypothesis formation for future experiments.

In summary, the main psychological processes that appear to inhibit or assist the process of conscious identification of a subliminal or psi stimulus are attitude, ego involvement, change in state of consciousness, flexibility of cognitive style, motivation, set or expectancy, and a familiarity and understanding of the way in which one's mind works at the primary process level.

Conclusions

The major result from this experiment is the overall lack of difference between the s.p. and psi hit rate. On both an objective and a subjective basis no participant was able to distinguish consciously between the two phenomena either during or after the session; there

seems to be no clear way of differentiating between the two at the response side of the process, although obviously they are quite clearly different at the stimulus side. There are several possible explanations for this, of which I here offer the one that seems most likely to me.

Within a free-response experiment of this type, the way in which we become aware of the stimulus is through primary-process mentation, namely dream-like images, feelings etc. This mentation then needs to be "judged" at a conscious level in order to associate it with the target. In the design of this experiment this process was identical for both phenomena, and the similarity in hit rate indicates that the subliminal information did not emerge into the primary process mentation any more clearly than did the psi information, and was accordingly subject to the various psychological factors that affect such a judging procedure. It is only by examining all of these psychological variables that we can understand the dynamics of becoming aware of low-level information input such as the psychic or the subliminal.

The most important of these psychological factors appears to be attitude. Attitude in its turn is related to one's openness to various forms of experience. S.p. is as affected by this psychological variable as parapsychologists have found psi to be. This is shown quite explicitly by the various questionnaires in which s.p. correlates more

strongly than does psi, both of them relating in a similar manner.

All of these results are fairly preliminary, but they do suggest an overall pattern which is of interest to those concerned with the "gestalt" of Ganzfeld experiments, and the optimal conditions for obtaining psi. Psi, once present in the subconscious, appears to be processed in a manner similar to other more familiar modes of perception.

Chapter 7.

THE FINAL EXPERIMENT

A Comparison of Psi and Subliminal Perception with "Naïve" Participants

Introduction

This final experiment was run since a criticism of the previous two had been that I worked with very few participants all of whom gained considerable experience with the Ganzfeld. Although this had been a deliberate policy of mine in line with my interest in a more global approach, I was asked if I could see what the outcome would be with a larger number of participants who had no previous experience with the Ganzfeld, and with whom I undertook a minimum of sessions.

Very little research has investigated the pros and cons of naïve versus experienced participants within the Ganzfeld; possibly the only research germane here is that of Sargent et al. (1982) which indicated that experienced participants score better than do naïve ones.

I divided this experiment into two series. Series 1 utilised a procedure identical to the Exploratory Study, whilst Series 2 used the procedure from the Follow-Up Study. Unfortunately, not every participant completed their allotted number of sessions so there were a total of 29

participants doing 58 sessions.

Three hypotheses were stated prior to running the experiment:

H1) Overall results from naïve participants will be closer to Mean Chance Expectancy than those obtained from experienced participants on prior occasions.

H2) Naïve participants will score relatively better on the subliminal sessions.

H3) The level of scoring will depend on attitude, motivation, target type and other psychological parameters.

All these hypotheses are based on results from the previous experiments.

SERIES 1

Method

A full description will not be given here, since the details are contained in the Exploratory Study. Details that differ from that Study will be described.

Participants

15 participants, ranging from 20 - 60 years old, and in a wide variety of occupations, took part on a voluntary basis. Some were acquainted with the experimenter previously, others had heard about the research and were interested in taking part, but were complete strangers. Some

formed subject - agent pairs. All the rest were provided with an agent by the experimenter.

Apparatus

This was identical to the Exploratory Study.

Session Design

All sessions used the Ganzfeld technique. The session condition, psi or s.p., the target pool and the target tape were all chosen by the agent after the participant was in the Ganzfeld, using random entry into random number tables. The one constraint was non-repeatability of the target pool, so that no participants had prior knowledge of any of the potential targets.

Prior to session 1, all participants completed an Attitude-to-psi questionnaire, apart from two participants. Prior to session 2, if this took place, all participants completed the As Openness to Experience Inventory. 7 participants did so.

Stimuli

These were identical to the Exploratory Study.

Procedure

This was identical to the Exploratory Study except for four sessions in which the participant knew the agent. Only one session was run per day, and the agent chose the target and session condition in the manner described above. After the experiment was finished typed transcripts were sent to two independent judges who were both experimenters with previous experience of the Ganzfeld.

RESULTS

1) Participants' Target Scoring

The participants' ratings of the target pool were converted into z-scores using the method recommended by Stanford and Sargent (1983) as in the previous experiments. Neither the psi nor the s.p. sessions showed any suggestion of statistical significance (see Table 11).

There is no significant difference between the two experimental conditions, nor between the three target types, but the subliminal sessions and the pleasant targets show clear superiority over the others.

2) Personality Data

This will be presented together with the data from Series 2.

Table 11
COGNITIVE AWARENESS OF THE TARGET

Experimental Condition	No.of hits	No.of sess.	Rating z-score	t	p (2-tail)	Diff. between conditions(t)
Overall	11	22	+0.146			
Psi	5	12	-0.009	0.027	n.s.	>0.648(n.s.)
S.p.	6	10	+0.285	0.848	n.s.	

Target type:						
Pleasant	8	11	+0.576	1.817	n.s.	
Unpleasant	3	7	-0.003	0.007	n.s.	
Neutral	0	4	-0.823	2.964	.06	

3)Physiological Data

The GSRs were analysed using 10-second epochs around an estimated stimulus point. Since the target word was repeated three times at each stimulus point, this was pretty accurately assessed. The remainder of the analysis was as for the Exploratory Study.

Neither the psi nor the s.p. sessions showed significant trend conductance scores: psi, $t = 1.374$; s.p., $t = 0.186$. There is no significant difference between the two conditions, but once again the psi conductance scores are greater than the s.p.

4)Independent Judges

Results from the two independent judges were analysed in the same way as the participants and are presented in Table 12.

Table 12
JUDGES' SCORING OF THE TARGETS

Experimental Condition	No.of hits	No.of sess.	Rating z-score	t	p (2-tail)	Diff.between conditions(t)
Judge 1: Overall	16	22	+0.504			
Psi	10	12	+0.760	3.439	.01	>1.033(n.s.)
S.p.	6	10	+0.370	1.118	n.s.	
Pleasant	9	11	+0.832	4.538	.003	
Unpleasant	5	7	+0.398	0.996	n.s.	
Neutral	2	4	-0.143	0.305	n.s.	
Judge 2: Overall	7	22	-0.043			
Psi	4	12	+0.050	0.189	n.s.	>0.549(n.s.)
S.p.	3	10	-0.156	0.568	n.s.	
Pleasant	5	11	+0.033	0.097	n.s.	
Unpleasant	2	7	-0.070	0.210	n.s.	
Neutral	0	4	-0.722	4.466	.05	

Thus, Judge 1 scored the participants' session transcripts significantly positively for the psi sessions, and for the pleasant targets, whilst Judge 2 obtained non-significant scoring throughout, the psi and the pleasant targets once again being above M.C.E. The relationship between the three sets of scorings on the data, participants and the judges, was examined using Kendall's coefficient of concordance (W). This gave $W = 0.585$, $\chi^2 = 36.73$, $df = 21$, $p = .02$, which suggests that the three sets of ratings are related. Those transcripts which all three rated highly were all pleasant targets, the two highest being psi sessions, and the next three highest being s.p. sessions. Those transcripts which all three rated lowest were unpleasant and neutral targets.

SERIES 2

Method

For a full description of the method see the Follow-Up Study. Only those details which differ from that study will be presented here.

Participants

14 participants ranging from 20 - 40 years old, and in a wide variety of occupations, took part on a voluntary basis. Some were acquaintances of the experimenter, whilst others came in response to a questionnaire handed out at a conference and so were complete strangers. Two people had been agents in the Follow-Up Study.

Apparatus

This was identical to that used in the Follow-Up Study.

Session Design

Each participant was assigned to three Ganzfeld sessions; one s.p., one psi and one control. The order of these and of the target pool and tape were all pre-arranged by an independent person who placed the appropriate instructions in sealed envelopes. These were kept in a locked drawer by the laboratory technician. Randomisation

was effected using the random number generator programme of a TI 58C calculator. There was a limitation of non-repeatability of experimental session and of target pool for each participant.

The control session differed from those in the two previous experiments in that it was a baseline session for clairvoyance - precognition. Thus a target pool and tape was designated in the instructions but was not played. The blank control tape was played. Therefore, nobody knew the target until the end of the session when feedback was given, as the target code was meaningless to the agent. The participant judged the control sessions as they did the psi and s.p. and so did not know the session condition until the end of the experiment.

Stimuli

These were identical to the Follow-Up Study.

Procedure

This was identical to the Follow-Up Study.

RESULTS

1) Participants' Target Scoring

All analyses were performed as for the Follow-Up Study. The results are given in Table 13.

Table 13
PARTICIPANTS' TARGET SCORES

Experimental Condition	No.of hits	No.of sess.	Sum-of ranks	p (1-tail)	Rating z-score	t	p (1-tail)
Overall	17	36	91	n.s.	-0.126		
Psi	3	12	35	.124	-0.493	1.849	n.s.
S.p.	10	14	27	.036	+0.386	1.603	.06
Control	4	10	29	n.s.	-0.404	1.197	n.s.

The significant s.p. result should be treated with caution as it was only marginally significant on the rating analysis. There was a significant difference between the psi and s.p. conditions using a related t-test: $t = 2.38$, $df = 10$, $p = .05$, two-tailed; and between the s.p. and the control conditions: $t = 3.084$, $df = 8$, $p = .02$, two-tailed. A Spearman rank correlation between the ratings on the psi and s.p. sessions was non-significant, $r = 0.173$.

These results are the first in the whole thesis to show a significant difference between the two conditions, the significance being due primarily to the psi-missing that occurred in this experiment. There is, therefore, a possibility that subliminal perception is marginally "easier" for naïve participants in the Ganzfeld. Personally I feel that the difference is due to personality factors which I shall elucidate in the Discussion.

which I shall elucidate in the Discussion.

2) Personality Questionnaires

The results presented below are composed of data from both Series 1 and Series 2 so as to give a broader scope to the analysis. All analyses use the rating z-scores and the Spearman Rank Correlation r_s . The results are presented in Table 14.

Table 14
PERSONALITY CORRELATIONS

Correlation	Spearman r	p
Attitude and overall z-score	0.370	.05
Attitude and psi z-score	0.228	n.s.
Attitude and s.p. z-score	0.415	.04
-----	-----	-----
Attitude and Ås Inventory	0.572	.025
Attitude and Ås Scale D	0.574	.025
Attitude and Ås Scale H	0.384	.07
Attitude and Ås Scale I	0.585	.02
-----	-----	-----
Ås Inventory and overall z-score	0.304	n.s.
Ås Inventory and psi z-score	0.276	n.s.
Ås Inventory and s.p. z-score	0.043	n.s.

The results from the attitude correlation substantially confirm the findings from the two previous experiments. The only difference in this experiment is with the Ås Inventory sub-scales, Scale I achieving a certain importance in this experiment. Scale I is a measure of basic trust in interpersonal relations.

The non-significance of the Ås Inventory and psi z-score is due solely to one person who scored the highest on the Ås and had the second lowest psi score.

3) Physiological Data

All analyses were identical to those in the Follow-Up Study. The subliminal sessions exhibited a non-significant physiological response to the stimuli, $t = 1.25$, $df = 12$. The psi sessions showed no response whatsoever to the stimuli, $t = -0.04$, $df = 8$. The control sessions were precisely at chance, $t = 0.0008$, $df = 7$. There was no significant difference between any of these conditions.

When the conductance trend scores were analysed with regard to those sessions on which the participant had scored a hit or a miss, the hit sessions showed a very marginal suggestion of significance: $t = 1.549$, $df = 14$, $p = .07$. The miss sessions exhibited a negative response, which suggests that there was no physiological response to the stimuli on these sessions. The difference between the two is

significant: $t = 2.046$, $df = 28$, $p = .02$. Both values are one-tailed. This is the first occasion on which there has been a difference in physiological response between the hit and the miss sessions, this difference essentially being that between the subliminal and psi sessions as nearly all the hit sessions were subliminal.

4)Independent Judges

Results from the two independent judges were analysed in the same way as those from the participants. The results are presented in Table 15.

Table 15
JUDGES' RATINGS OF THE TARGETS

Condition	No.of hits	No.of sess.	Sum-of ranks	p (2-tail)	Rating z-score	t	p (2-tail)
Judge 1:							
Overall	20	36	86	n.s.	+0.047		
Psi	5	12	32	n.s.	-0.293	1.350	n.s.
S.p.	8	14	33	n.s.	+0.201	0.720	n.s.
Control	7	10	21	n.s.	+0.238	1.249	n.s.
Judge 2:							
Overall	17	36	89	n.s.	+0.041		
Psi	4	12	30	n.s.	-0.083	0.376	n.s.
S.p.	10	14	28	.122	+0.525	2.060	.055
Control	3	10	31	.066	-0.490	3.583	.008

All scores from Judge 1 are non-significant; there is no difference between the psi and s.p. sessions, nor between the s.p. and control sessions, but there was a significant difference between the psi and control sessions; $t = 3.133$, $df = 7$, $p = .02$.

Results from Judge 2 show marginally significant above chance scoring on the subliminal sessions, whilst the control sessions show significant missing. All scores are two-tailed. The difference between the subliminal and psi sessions is significant; $t = 2.238$, $df = 10$, $p = .05$, and also between the subliminal and control sessions; $t = 4.45$, $df = 8$, $p = .004$, but is marginally non-significant between the psi and control sessions; $t = 2.217$, $df = 7$, $p = .07$.

Once again the relationship between the three sets of scoring on the data was examined using Kendall's Coefficient of Concordance. This gave $W = 0.566$, $\chi^2 = 59.43$, $df = 35$, $p = .01$, which suggests that the three sets of ratings are related. Those transcripts which were rated highest by all three were all s.p. sessions, whilst those transcripts rated lowest by all three were a mixture of s.p. and psi.

DISCUSSION

In hypothesis 1 I suggested that naïve participants would not, on the whole, be so successful at correctly choosing s.p. and psi targets within a Ganzfeld setting as are experienced participants. In Series 1 there is no difference from results in the Exploratory Study, both experiments giving non-significant negative psi results, with the s.p. results in this experiment being marginally improved. In both the Exploratory study and in Series 1 there is no significant difference in the scoring of the two conditions, and in both the effect of the experimental condition was strongly overshadowed by the effect of the different target types, with the pleasant targets being strongly associated with positive scoring, and the unpleasant and neutral targets with negative, or defensive, scoring.

Much the same situation applies to Series 2, in which the subliminal sessions appear to be rather more successful in this experiment than they were in the Follow-Up Study. The only case in which Hypothesis 1 is even marginally supported is in the psi sessions, which in Series 2 are non-significantly negative whilst in the Follow-Up Study they were significantly above chance. Both judges corroborate this with below chance scoring for the psi sessions and above chance scoring for the subliminal

sessions, this latter reaching marginal significance with one of the judges. There was in Series 2 a significant difference between the two conditions. I suggest, therefore, that hypothesis 1 be rejected insofar as subliminal phenomena are concerned, and that this experiment gives a small non-significant suggestion that experienced participants may score better with psi stimuli than do naïve participants, under certain circumstances.

The reasons for the psi-missing though, should, I feel, be understood more in terms of the overall psychodynamics of this experiment, rather than purely in terms of experienced versus naïve participants. This experiment was undertaken on the wishes of my supervisor at City University, London, who had no belief at all in the reality of psi phenomena and so no understanding at all of the research I was undertaking. As far as she was concerned the positive results from the Follow-Up Study were not valid, and the only experimental design that she would countenance was the standard design of a large number of naïve people undertaking a minimum number of sessions. These participants were preferably to be strangers to every aspect of the experiment.

Therefore, I undertook the experiment under a feeling of obligation and constraint, rather than because I was seeking answers to a question that I was interested in, as in the previous experiments reported in this thesis.

Further, I find it very difficult to be constantly preparing new people for Ganzfeld sessions, as this takes a lot more time and energy than with those who know what is involved, particularly with people I have not met before. Taking part in a Ganzfeld session requires a large amount of trust, in that the participant is "talking out" personal thoughts, images, fantasies, memories, etc. that well up from the subconscious. Doing this with a stranger requires a far greater degree of assurance, relaxation etc. from the experimenter than when both are friends. Of interest with regard to this subjective observation is the result from the As Inventory, Scale I - a measure of interpersonal trust - correlating more significantly with the Attitude questionnaire than any other Scale. This scale has never been of particular importance in previous experiments.

Thus, Hypothesis 2, that naïve participants would score relatively better on s.p. sessions is supported, particularly in Series 2, but with the above provisos kept in mind. I have finally found a significant difference between the two phenomena, which I feel requires confirmation, and would suggest that this difference is related to s.p. being a more robust phenomenon under difficult circumstances.

Hypothesis 3 suggested that all the scoring would be dependent on various psychological factors. I have already remarked on two of these: the effect of the

different target types in Series 1, and the relationship with Ås Scale I in both series. As with the Exploratory and Follow-Up Studies, the participants' attitude towards psi is the most important determinant of their overall score, this relation being marginally significant in all three experiments. This relation is also significant in all three experiments with regard to the s.p. sessions, the psi correlation being non-significant in the same direction. I, therefore, feel it is permissible to say that this thesis does support Schmeidler's proposal, and, more importantly, that openness of attitude is clearly related to one's level of subliminal scoring. That the "sheep-goat" hypothesis should generalise to s.p. is fascinating, and suggests that both phenomena are affected by similar psychological factors.

Once again, the Ås Inventory correlates significantly with attitude, this finding being consistent over all three experiments. As in the Follow-Up Study, Scales D and H (dissociation and peak experiences) appear to be major influences in this correlation, but on this occasion Scales A and B are not important, Scale I rising into prominence. The correlations between Ås and rank score were remarkably similar to those of the Exploratory and Follow-Up Studies, being non-significantly positive in all three, such that those participants who are most open to various experiences are more likely to score positively on

both psi and s.p. tasks.

For some strange reason there was no indication of a physiological response in either series, in contrast to the earlier experiments. Why this should be is a complete mystery to me.

Conclusion

The findings from this final experiment, whilst being depressingly non-significant on many counts, do surprisingly confirm several important findings from the earlier experiments, and do suggest one possible difference between psi and subliminal perception.

Chapter 8 .

SUBSIDIARY PSYCHOLOGICAL TESTS

1)Mood Reports

These were given to all participants just prior to and just after every Ganzfeld session, as has already been mentioned in the Method section of each experiment. They were adapted from Carpenter, who obtained his Mood Adjective Check List from Nowlis (Carpenter, 1968). Each Mood Adjective Check List (MACL or Mood Report) consisted of 50 adjectives describing various moods (see Appendix 5), and the participant was asked to check those words pertaining to their feelings at that moment. A measure was thus obtained of each participant's mood at the beginning and end of each session.

Unfortunately, such a method gives almost too much information and analysis has had to be a compromise between statistical test formalities and loss of relevant descriptive information.

a)Exploratory Study

In this experiment the mood reports were given only at the beginning and end of each session-day which comprised two sessions. The reports therefore muddle the effects of those two trials and so cannot be analysed statistically.

However, as a preliminary to further analysis, I

factor-analysed all the reports and found that the mood adjectives fell into five main categories:

1) Comfortable	2) Elated	3) Drowsy	4) Serious
Relaxed	Excited	Lightheaded	Sad
Friendly	Forceful	Drifting	Dull
Warmhearted	Adventurous	Lazy	Disinterested
Genial	Energetic	Dreamy	Uncomfortable
Happy	Assertive	Quiet	Depressed
Amiable	Decisive	Languid	Jumpy
Interested	Fearless	Lackadaisical	Hypersensitive
Satisfied	Childish	Sensual	Angry
Cheerful	Silly	Erotic	Tense

5) Withdrawn

Indifferent
Bored
Dissatisfied
Confused
Hesitant
Threatened
Defensive
Tired
Retiring

Naturally, the factor analysis did not separate them so neatly into 5 groups of 10 words each, so the final

two groups have some words that are "floating" words and could fit equally into some other group.

The main factor is Group 1 which is a general pre-session positive affect factor receiving 49% of all checks prior to the session, and 39% of all the checks after the session (see Table 16).

Table 16
EXPLORATORY STUDY MOOD REPORT

	Before		After	
	N	%	N	%
Group 1 (Comfy)	114	49.1	78.5	39.5
Group 2 (Speedy)	33	14.2	17.5	8.8
Group 3 (Drowsy)	35	15.1	49.5	24.9
Group 4 (Tense)	27	11.7	17	8.5
Group 5 (Bored)	23	9.9	36.5	18.3

I define this group by the word "comfortable". The next major factor was Group 3 which is a general post-session positive affect group, clearly showing the effects of the Ganzfeld on mood, receiving only 15% of the checks prior to the session, but 25% after. I use "drowsy" to define this group. Group 2 also consists of positive emotional words, which are rather more active than Group 1 and which I

characterise by the word "energetic". As with Group 1 these words were used primarily pre-session. Groups 4 and 5 were rarely used by contrast, but Group 4 appears to be primarily a pre-session negative emotional group, with Group 5 the negative counterpart of Group 3. This is primarily due to the presence of words such as "tired" which are not necessarily negative.

The Exploratory Study had half the sessions full Ganzfeld and half partial-Ganzfeld. Thus half the time the post-session report came directly after a full-Ganzfeld, and half the time it came after a partial-Ganzfeld. The following table shows the results of this (Table 17).

Table 17
EFFECT OF GANZFELD ON MOOD

	Full-Ganzfeld		Part-Ganzfeld	
	N	%	N	%
Group 1 (Comfy)	70	36.1	87	42.7
Group 2 (Speedy)	18	9.3	17	8.3
Group 3 (Drowsy)	54	27.8	44	21.6
Group 4 (Tense)	14	7.2	22	10.8
Group 5 (Bored)	38	19.6	34	16.7

The main effect of the full-Ganzfeld is a rise in Group 3, but any difference is very slight and confounded by

the fact that the participants had experienced both sessions.

Differences in post-session checking due to target type are presented in the following table 18.

Table 18
EFFECT OF TARGET ON MOOD

	Pleasant		Unpleasant		Neutral	
	N	%	N	%	N	%
Group 1 (Comfy)	52	48.0	43	38.4	20	37.7
Group 2 (Speedy)	10	9.2	12	10.7	3	5.7
Group 3 (Drowsy)	25	23.0	24	21.4	17	32.1
Group 4 (Tense)	5	4.6	14	12.5	2	3.8
Group 5 (Bored)	16	14.8	19	16.7	11	20.7

Again these results are confounded by the person having done two sessions in the day. The scores are taken for the target type immediately preceding the post-session mood report. The pleasant stimuli have the highest checking of Group 1 and the lowest of Group 4 and Group 5. This effect is highlighted if the shift in mood from pre- to post-session mood is examined, using the percentage scores, as shown in Table 19.

Table 19

Effect of Targets on Mood Shift Over Session (% scores)

	Pleasant			Unpleasant			Neutral		
	Pre	Post	d	Pre	Post	d	Pre	Post	d
Group 1 (Comfy)	40.9	48.0	+7.1	46.5	38.4	-8.1	50.0	37.7	-12.3
Group 2 (Speedy)	6.4	9.2	+2.8	18.6	10.7	-7.9	8.3	5.7	- 2.6
Group 3 (Drowsy)	19.1	23.0	+3.9	11.6	21.4	+9.8	27.1	32.1	+ 5.0
Group 4 (Tense)	10.9	4.6	-6.3	16.3	12.5	-3.8	4.2	3.8	- 0.4
Group 5 (Bored)	22.7	14.8	-7.9	7.0	16.7	+9.7	10.4	20.7	+10.3

This table shows that the neutral stimuli and the unpleasant stimuli are related to a mood shift which differs from the pleasant stimuli with a drop in Groups 1 and 2, and a rise in Group 5. This negative effect of the neutral stimuli as well as the unpleasant was apparent when discussing the sessions with the participants, who found the lack of any theme with the neutral stimuli very hard to grasp or to imagine, and so they felt frustrated and irritated.

The next table indicates the effect of the different experimental conditions on the shift in mood over the session. Once again percentage scores are used (see Table 20).

Table 20

Effect of Experimental Condition on Shift of Mood

	Subliminal			Psi			Control		
	Pre	Post	d	Pre	Post	d	Pre	Post	d
Group 1 (Comfy)	51.5	37.0	-14.5	41.0	46.0	+5.0	35.0	33.0	-2.0
Group 2 (Speedy)	15.4	8.9	- 6.5	6.0	9.6	+3.6	12.5	8.1	-4.4
Group 3 (Drowsy)	13.8	25.2	+11.5	22.2	23.3	+1.1	25.0	26.8	+1.8
Group 4 (Tense)	10.8	11.1	+ 0.3	9.4	6.2	-3.2	13.3	10.6	-2.7
Group 5 (Bored)	8.5	17.8	+ 9.3	21.4	15.1	-6.3	14.1	21.1	+7

According to the above table the subliminal stimuli seem to have had a rather negative effect on mood, which could well be related to the relatively more negative scoring on the subliminal stimuli, and suggests that the negative effect of the targets was more pronounced in this condition. This suggestion is corroborated by examining separately the sessions which were "hits" and those which were "misses" (see Table 21).

Since the Mood Reports were completed prior to any judging, and therefore prior to knowledge of target, experimental condition etc., the differences indicated by the above series of tables are quite intriguing. Neutral and unpleasant targets, sessions on which the participant missed the target, and subliminal sessions all show the same pattern, whilst psi sessions, pleasant targets and hit

Table 21

Effect of Hitting or Missing the Target on Mood Shift

	Pre	Hit Post	d	Pre	Miss Post	d
Group 1 (Comfy)	41.8	47.5	+5.7	49.3	37.8	-11.5
Group 2 (Speedy)	10.2	11.0	+0.8	12.2	8.3	- 3.9
Group 3 (Drowsy)	16.3	22.9	+6.6	18.9	24.4	+ 5.5
Group 4 (Tense)	16.3	8.5	-7.8	6.8	7.7	+ 0.9
Group 5 (Bored)	15.3	10.2	-5.1	12.8	21.8	+ 9.0

sessions all show the same pattern. Could it, therefore, be the change in mood over the session that gave the positive or negative scoring, or are the two linked in a feedback manner? As to the significance of these shifts in mood, there is no way of knowing. These are merely observed descriptions which served to enable hypotheses to be formulated for the Follow-Up and Final studies.

2)The Follow-Up Study

As a result of the descriptive evidence from the Mood Reports in the Exploratory Study, two hypotheses were formulated:

1)There will be an increase in Group 3 moods over the session.

2)Hit sessions will tend to be related to shifts towards a more positive mood; miss sessions with a shift towards a more negative mood.

No hypotheses were formulated with regard to any possible differential effect on mood of the subliminal or psi conditions, as I suspected that the negative effect related to the subliminal condition in the Exploratory Study was confounded by the negative effect of the targets.

The same basic procedure was followed in this experiment as in the previous one, the participants checking those mood adjectives that best described their mood just prior to, and just after the session, before the judging procedure.

The check list was slightly different from the one used in the Exploratory Study, in that those adjectives which had never been used were discarded and adjectives that had been suggested by the participants during the Experiment were inserted in their place (see Appendix 6). Because of these slight changes the scores were again factor analysed, and once again five major factors emerged, which were

virtually identical with those of the Exploratory Study: Groups 1 and 2 were positive pre-session factors, and Group 3 a positive post-session factor. Groups 4 and 5 were negative factors, 4 being more "active" and 5 more "passive".

The mood reports were analysed by averaging the checks from all the participants to obtain mean scores. These were then subjected to a Two-Way completely randomised ANOVA (see Table 22).

Table 22
Effect of Experimental Condition on Shift in Mood

	Pre	Psi Post	d	Subliminal Pre	Post	d	Control Pre	Post	d
Group 1 (Comfy)	98.6	89.0	- 9.6	103.0	85.9	-17.1	133	76	-57
Group 2 (Speedy)	45.8	26.0	-19.8	51.5	36.8	-14.7	76	22	-54
Group 3 (Drowsy)	31.7	58.6	+26.9	31.8	53.4	+21.6	38	61	+23
Group 4 (Tense)	12.8	13.1	+ 0.3	14.5	14.2	- 0.3	20	7	-13
Group 5 (Bored)	10.5	22.3	+11.8	12.1	22.7	+10.6	7	20	+13

There was no significant difference between conditions, but there was a significant difference between mood factors: Presession, $F = 16.58$, $df = 2,8$, $p = .001$; Postsession, $F = 9.72$, $df = 2,8$, $p = .01$.

The scores for the single baseline control session

post-session are probably artifactual as the participant and experimenter knew that it was a control as there was no target pool for judging. There appears from these results to be no major difference in mood shift dependent on the experimental condition. Both psi and subliminal sessions show the expected rise in Group 3 over the session, both show decreases in Groups 1 and 2 over the session, minimal change in Group 4 and a rise in Group 5.

When the data are analysed in terms of Hit and Miss sessions, the results as shown in Table 23 occur.

Table 23

Shift in Mood related to Hitting or Missing the Target

	Pre	Hit Post	d	Pre	Miss Post	d
Group 1 (Comfy)	105.6	81.9	-23.8	86.8	85.1	- 1.7
Group 2 (Speedy)	51.9	34.4	-17.5	47.2	23.7	-23.5
Group 3 (Drowsy)	26.1	58.2	+32.1	42.4	45.6	+ 3.2
Group 4 (Tense)	16.9	15.8	- 1.1	7.1	14.4	+ 7.3
Group 5 (Bored)	11.9	19.6	+ 7.7	8.4	21.0	+12.6

A Two-Way Completely Randomised ANOVA gives a significant difference between conditions; $F = 21.38$, $df = 1,7$, $p = .004$. Once again there is a significant difference between the five mood groups; $F = 5.97$, $df = 4,7$, $p = .05$.

The interaction between the two is not significant.

The major differences, between the sessions on which the participant scored a hit and those on which they missed the target, appear to be in Groups 1 and 3 with the Hit sessions showing a large mood shift in both of these groups, whilst the Miss sessions show hardly any shift in mood in this respect, although this lack of shift appears to be partly because the pre-session mood appears to be a rather "drowsy" one on those sessions in which they later missed the target. Thus on sessions in which the person hit the target they come in in a more comfortable, relaxed and energetic mood than on those sessions on which they miss the target. The Miss sessions also indicate a relatively greater increase in mood negativity, though this is partly a result of less checking of these words pre-session.

This quick profile merely scratches the surface of the enormous quantity of data collected, but because of the risk of over-analysis of which I have previously been accused, I shall stop here.

3)The Final Study

This was split into two series, and each series used the Mood Report appropriate for that part.

Only the Mood Reports from Series 2 have been analysed, as the analysis of the Follow-Up Study allows for an appropriate comparison, whereas that of the Exploratory Study was very preliminary. The results reported in Table 24 are the totals of all the participants who completed all three sessions (N = 8).

Table 24
Shift in Mood Related to Experimental Condition

	Pre	Psi Post	d	Subliminal Pre	Post	d	Control Pre	Post	d
Group 1 (Comfy)	145	99	-46	99	70	-29	94	61	-33
Group 2 (Speedy)	54	27	-27	29	27	- 2	22	8	-14
Group 3 (Drowsy)	36	74	+38	67	76	+ 9	54	71	+17
Group 4 (Tense)	6	4	- 2	24	10	-14	8	4	- 4
Group 5 (Bored)	7	22	+15	25	25	0	10	19	+ 9

The results from the Final Study are very similar to those of the Follow-Up with a drop in Groups 1 and 2 over the session, and an increase in Groups 3 and 5. The control here is a truer measure as it was a baseline precognition - clairvoyance measure and so there was a

judging target sheet, and neither participant nor the experimenter knew that it was a control session until the end of the experiment.

Once again ANOVAs of the pre- and post-session Mood Shifts give a significant difference between the different Mood Groups, but not between the experimental conditions indicating that the experimental condition per se does not affect the participants mood. There is, however, a significant interaction for the Shift in Mood over the session between the five mood groups and the experimental conditions, $F = 7.44$, $df = 4,8$, $p = .01$. However, as neither Factor A nor Factor B were independently significant this finding must be treated with the utmost caution. The raw data indicate that the psi sessions show the strongest mood shifts. This is concentrated primarily in Groups 2 and 3 making a strong shift to a drowsy hypnagogic state, since these two groups are obviously related.

When the Hit and Miss sessions are analysed the following results occur (see Table 25).

This is a by now familiar pattern. Once again only the interaction is significant, $F = 8.52$, $df = 4,8$, $p = .01$. This difference is concentrated primarily in Groups 4 and 5.

Table 25

Shift in Mood relating to Hit and Miss Sessions

	Pre	Hit Post	d	Pre	Miss Post	d
Group 1 (Comfy)	123.8	90.2	-33.6	114.7	103.8	-16.9
Group 2 (Speedy)	40.8	28.8	-12.0	57.0	16.5	-18.5
Group 3 (Drowsy)	61.9	97.5	+35.6	34.5	73.5	+31.0
Group 4 (Tense)	22.2	7.8	-14.4	15.3	10.7	- 4.6
Group 5 (Bored)	24.5	21.7	- 2.8	13.7	26.0	+15.3

2) Semantic Differential and Word Association Tests

Whilst preparing the Follow-Up Study, Prof. N.F. Dixon suggested that it might be interesting to do a semantic differential around the target words, their conscious word associates, and those images occurring during the session in temporal contiguity with the stimulus onset.

Accordingly, word association sheets for each target pool were prepared with the 20 words in random order (see Appendix 7). At the end of the Ganzfeld session, after the participant had filled in the Mood Report, the experimenter presented each target word, to which the participant responded with the first word which came to mind. This response was timed. This was the first conscious contact the participant had with the words in the target pool. After completing the word association test, the participant was given the target pool sheet and judged the four themes for similarity with their session mentation. After the judging was complete the participant was given the Semantic Differential booklet which consisted in the five target word, the five word associates (A) and the first five images (I) temporally related to stimulus onset as recorded by the experimenter during the session, i.e. when the agent pressed the communication light switch. Since each target word was repeated five times over the fifteen minute sending period, the first five stimulus related images were used.

Control words (C) were obtained by using words picked at random from other session booklets.

Five differential scales were used: Active - passive; Momentary - eternal; Black - white; Usual - Unusual; and Soft - hard; in that order. Analysis was done using the Biomed. Package P24; 3-Way ANOVA for Repeated Measures with the following results:

Table 26
ANOVA of Semantic Differential

Source	SS	df	MS	F	p
Mean	17848	1,7	17848	159.73	.00001
Cond.	2.97	1,7	2.97	0.34	.58
Dist.	156.41	2,14	78.2	11.69	.001
Fact.	90.95	4,28	22.74	2.89	.04
CxD	16.21	2,14	8.11	4.16	.038
CxF	18.83	4,28	4.71	2.39	.07
DxF	20.59	8,56	2.57	1.06	.41
CxDxF	11.99	8,56	1.50	0.74	.65

This can be understood as follows: The significant distance effect analysis (Dist., $p = .001$) measures the difference in personal conception of the word associate (dA), the image word (dI) and the control word (dC) from the target word. These three differ from one another to a significant degree. The word associate, i.e. the conscious associate to the target, shows the closest similarity in semantic concept to the target, whilst the image word overall shows the LEAST similarity to the target, the control word taking a median position. It is just possible that this is due to the uncertainty in choosing which five image words to represent the Ganzfeld session imagery. It would have been just as logical to have chosen five images from later stimulus points; or to have chosen five images which during the judging phase prior to feedback the participant had placed greatest weight on relative to the target.

The CxD interaction indicates that whilst the experimental condition (psi or s.p.) on its own is not significant, there is in fact a slight difference between them in that the s.p. session have the series dA:dI:dC in order of increasing distance from the target word, whilst the psi sessions have the series dA:dC:dI. This confirms the above discussion, since only in the s.p. sessions is the image word more closely related to the target than is the control word.

There is also a significant difference between the various semantic dimensions (Fact.). Overall the factors Passive - active and Hard - soft show the greatest differences in semantic conceptions of the various words, with the White - black factor showing the least. This pattern is consistent for the psi condition, but the s.p. condition indicates "disagreement" between the target and other words on the passive-active factor.

The only suggestion to emerge from this research is that possibly s.p. images do bear temporal relationship to stimulus onset, but psi images apparently do not. In fact the temporally related images seem to be almost polar opposites in that they are less related than the control words! But, having said this, there was no significant difference between the two experimental conditions with regard to the semantic differential analysis. The suggestive difference is, however, worth following up because of the interesting temporal aspect.

The word association response times associated with this gave no indication of any difference between the target words and the buffer words in the target pool for either condition. According to theory, the target words should have shorter response times owing to the participant having recently "perceived" them in the Ganzfeld session (see Table 27).

Table 27

Word Association Response Times to Stimuli

Condition	Subliminal	Psi	Hit	Miss
N	40	40	50	30
Target	2.207	2.225	2.237	2.182
Buffer	2.262	2.244	2.307	2.165

In all cases other than those sessions on which the person missed the target, response times for the target are in the expected direction, but not significantly so.

In the Final Experiment, Series 2 in which the participants also gave word associates to the words in the target pool, there is once again a non-significant difference between the target words and the buffer words in the pool, but this time in the opposite direction (see Table 28).

These results indicate that word association response time is not a very useful test of behavioural effects of subliminal or psi stimuli.

Table 28

Word Association Response Times to Stimuli(Series 2)

Condition	S.p.	Psi	Control	Hit	Miss	Total
N	12	11	10	15	18	33
Target	2.375	2.289	2.761	2.659	2.300	2.463
Buffer	2.407	2.198	2.583	2.535	2.270	2.391

3)State of Consciousness Report

This report was included in all three Ganzfeld experiments, initially following the method of Tart (1975) and Honorton (1973) in which participants had been asked to state the "depth" to which their state of consciousness had shifted during the session. However, after the end of the Exploratory Study when I was discussing it with the participants, they all felt that this procedure was inadequate. Accordingly we designed a State Report as follows:

We defined 10 mental states that the various participants had noticed during their sessions:

Wittering:i.e., non-stop mental chattering;

Dialogue: internal conversation;

Photographic: one thought/image followed by
another in disjointed sequence;

Associative: One thought/image leading to another;

Memory: Remembered events;

Cinematic: Vivid dramatic imagery, often totally
autonomous;

Story-telling: Controlled dramatic imagery/fantasy;

Blank awareness;

Intuitional;

Body Sensations;

Any other. (see Appendix 8)

The 8 participants rated these on a 1 - 4 scale

according to the intensity with which they had been experienced during the session, with the following results as shown in Table 29. These figures represent the average from a total of 90 sessions, there being 40 each s.p. and psi, 10 control, 50 hit and 30 miss sessions.

Table 29
State of Consciousness Report - Follow-Up Study

State of Consciousness	N	Total	S.p.	Psi	Control*	Hit	Miss*
Wittering	10	0.31	0.13	0.36	0.86	0.33	0.18
Dialogue	4	0.13	0.15	0.07	0.00	0.13	0.17
Photographic	71	2.12	2.11	2.34	2.00	2.05	1.79
Associative	33	1.14	1.14	1.22	1.00	1.04	1.41
Memory	38	0.93	0.75	0.89	1.57	0.88	0.70
Cinematic	52	1.57	1.51	1.50	1.00	1.75	1.10
Story-telling	2	0.07	0.10	0.05	0.00	0.13	0.00
Blank awareness	29	1.52	1.50	1.28	1.57	1.43	1.74
Intuitional	13	0.36	0.23	0.33	0.29	0.39	0.19
Body sensations	17	1.04	0.80	1.21	1.43	0.93	0.65

N = The number of sessions in which that state was reported.

* = On these occasions only 7 participants contributed.

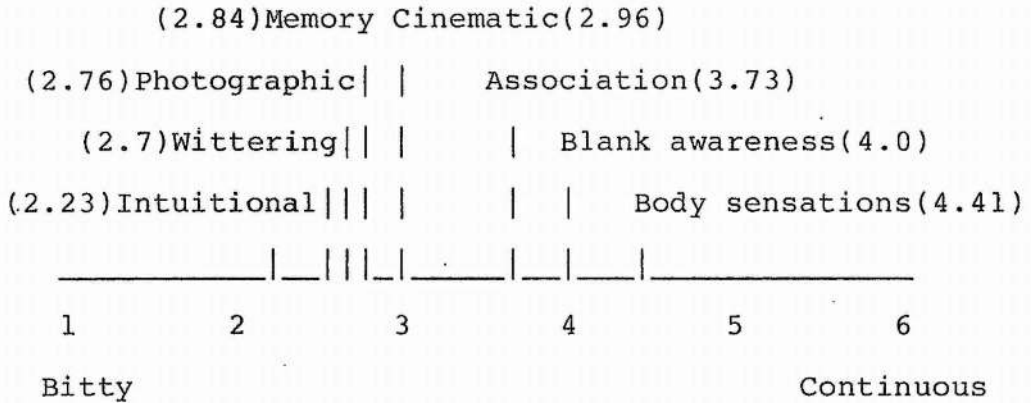
These results indicate that the state of consciousness most frequently and intensely experienced is the photographic, with the cinematic taking second place. Blank awareness, memories, and associations are all fairly frequently reported. The control sessions have the highest intensity of wittering and memories and body awareness; the miss sessions have the highest intensity of internal dialogue, associations and blank awareness; the hit sessions have the highest intensity of cinematic, story-telling and intuitional; whilst the psi sessions show the highest intensity of the photographic state of consciousness.

The next section in the State Report was a preliminary attempt to define the various states of consciousness on parameters such as "spontaneous - controlled"; "detached - involved"; "verbal - pictorial"; etc. The participants were asked to try to place each state of consciousness which they had experienced during the session on each of these scales (see Figure 11 and Table 30). Since story-telling and dialogue were reported so rarely, they will be excluded lest they muddy the picture.

Figure 11

7 Dimensions of Certain States of Consciousness Experienced
in the Ganzfeld

Dimension 1: Bitty - Continuous



Dimension 2: Controlled - Spontaneous

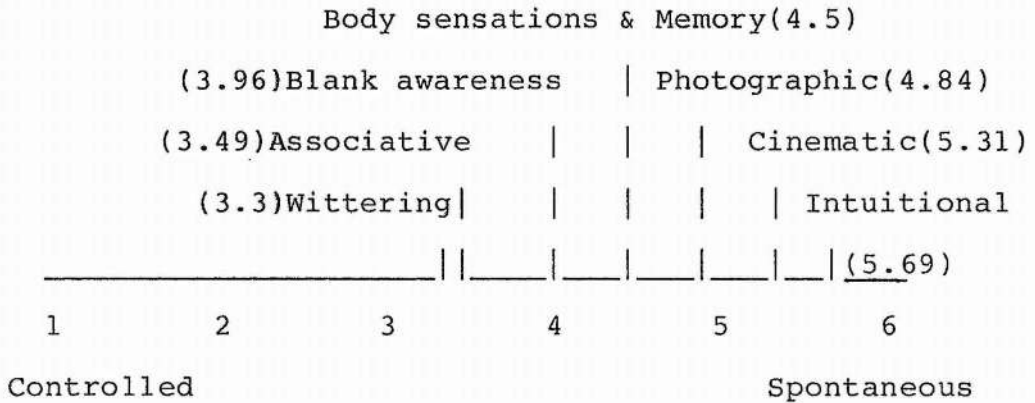
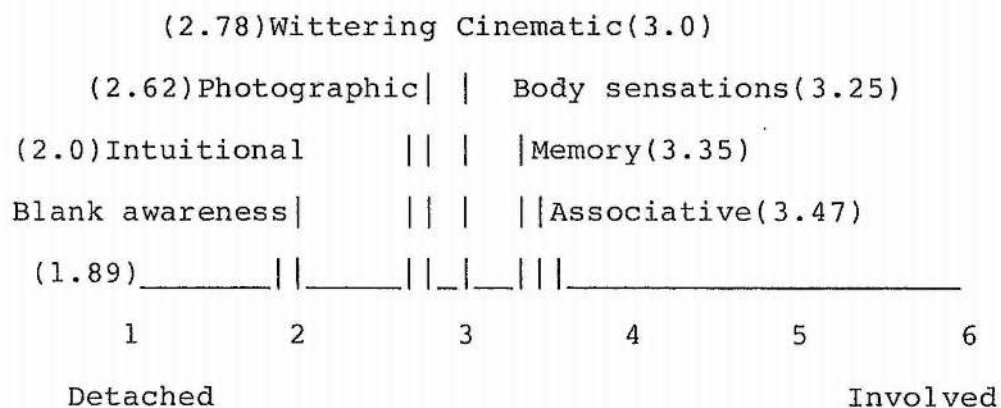


Figure 11 cont.

Dimension 3: Detached - Involved



Dimension 4: Verbal - Pictorial

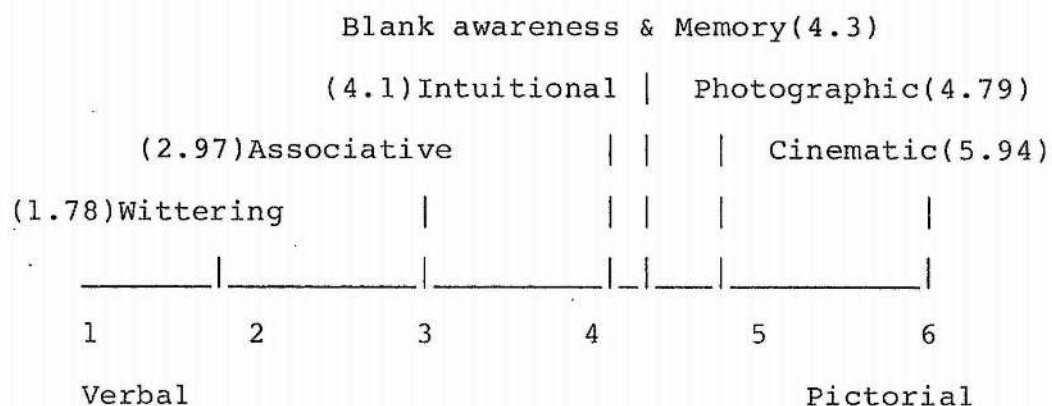
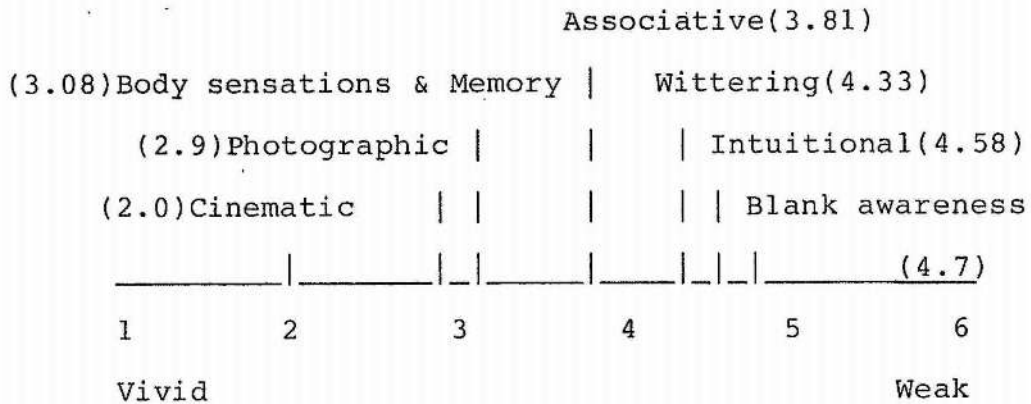


Figure 11 cont.

Dimension 5: Vivid - Weak



Dimension 6: Emotional - Unemotional

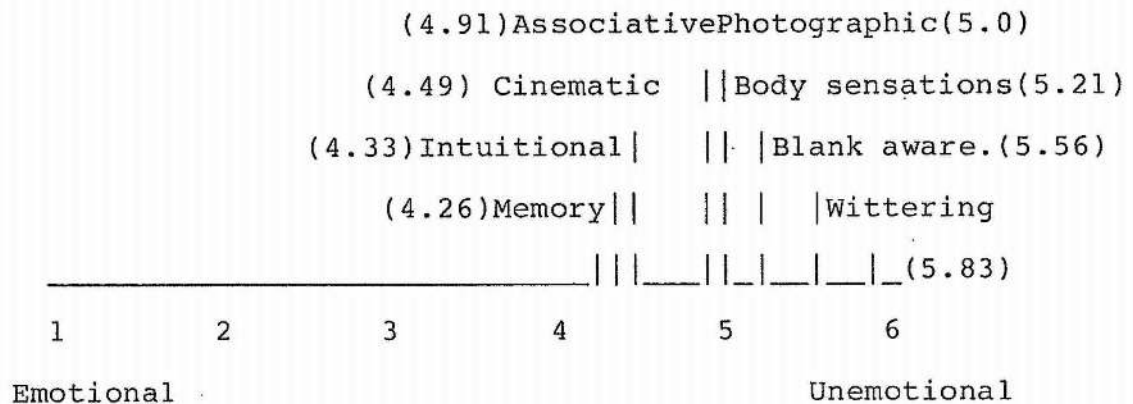


Figure 11 cont.

Dimension 7: Inward - Outward sensing

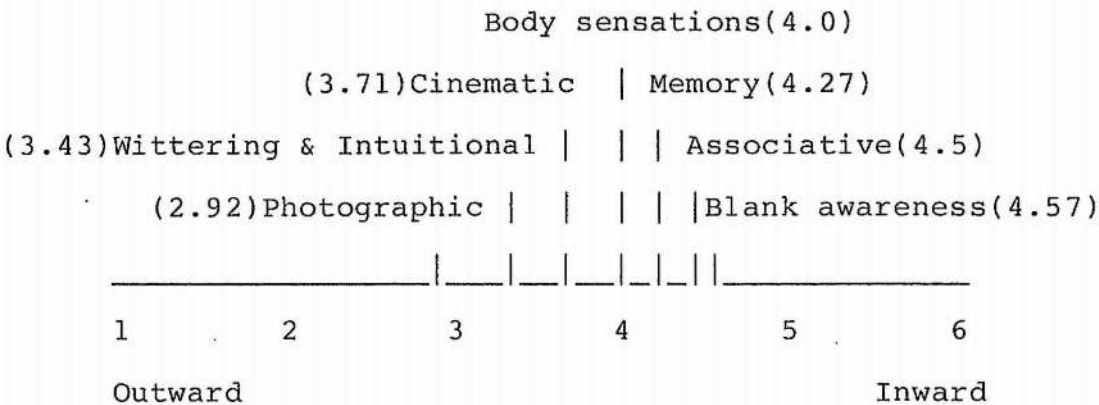


Table 30

7 Dimensions of States of Consciousness Experienced

State of Consciousness	Dimension						
	1	2	3	4	5	6	7
Intuitional	2.00	4.50	4.25	3.25	4.25	3.50	5.67
Wittering	2.70	3.30	2.78	1.78	4.33	5.83	3.43
Photographic	2.76	4.84	2.62	4.79	2.90	4.96	2.92
Memory	2.84	4.50	3.35	4.3	3.08	4.26	4.27
Cinematic	2.96	5.31	3.00	5.94	2.00	4.49	3.70
Associative	3.73	3.49	3.47	2.97	3.81	4.91	4.50
Blank awareness	4.00	3.96	1.89	4.3	4.7	5.56	4.57
Body sensations	4.41	4.50	3.25	---	3.08	5.21	4.00

Most of the results are what would be expected from common sense which is quite gratifying, because it means that this method is indeed valid. Thus, the intuitional state of consciousness comes only in flashes, whilst blank awareness and body sensations are fairly continuous. For some reason the wittering was felt to be fairly controlled, whilst the intuitional and cinematic were the most spontaneous. The scale with the widest range was the verbal-pictorial, with wittering at one end and cinematic at the other. Cinematic was also the most vivid state of consciousness, intuition and blank awareness obviously being the weakest. None of the states of consciousness were felt to be particularly emotional. The inward - outward sensing scale being similarly cramped; on the whole blank awareness and associations were felt to be the most internally oriented, with the photographic and intuitional externally oriented.

Thus, the Ganzfeld induces a primarily spontaneous visual type of mentation within a background of blank awareness, with some verbal intrusions, much as is suggested by White (1964) to be the most psi-conducive state.

This state report is still only in a preliminary stage, but it is quite possible that the presentation of the above descriptions will lead to some useful hypotheses that can be tested. The next step with regard to the Follow-Up Study data is to examine the states of

consciousness of the different participants since there were very different people taking part in that study (see Table 31).

Table 31
PARTICIPANTS' STATE OF CONSCIOUSNESS

State of Consciousness	S1	S2	S3	S4	S5	S6	S7	S8
Wittering	1.6	0.0	0.0	0.0	0.27	0.0	0.64	0.0
Dialogue	0.2	0.0	0.11	0.33	0.0	0.0	0.36	0.0
Photographic	2.6	2.45	1.11	0.83	2.09	1.6	2.45	3.8
Associative	2.8	2.45	0.33	0.0	1.91	0.0	1.45	0.2
Memory	1.2	1.27	0.11	0.0	1.64	0.0	1.91	1.3
Cinematic	1.2	0.73	2.44	1.83	0.0	1.85	2.0	2.5
Story-telling	0.0	0.0	0.0	0.0	0.18	0.0	0.36	0.0
Blank awareness	0.2	3.18	0.55	3.5	0.18	3.55	1.0	0.0
Intuition	1.2	0.64	0.11	0.33	0.0	0.0	0.36	0.2
Body sensation	1.6	0.0	0.55	2.67	0.18	0.0	0.91	2.4
N	5	11	9	7	11	10	11	10

The above table shows us that S8, who obtained 10 hits in 10 sessions, NEVER reported wittering, dialogue,

blank awareness, story-telling, and only once, associations. She experienced strong cinematic and photographic imagery (see Appendix 4), strong floating body sensations, which she often described as floating along a tunnel or flying over a landscape, and she also reported some auditory experiences. The other psi-hitter (S1) did experience wittering, dialogue and associations, especially at the beginning of the sessions, but these quickly declined allowing the photographic, and occasionally the cinematic, to emerge. He NEVER experienced story-telling, and only once dialogue and blank awareness. Unfortunately he only completed 5 of his 11 state reports.

S6, who scored significantly above chance overall, and for the s.p. condition, presents a different picture as mentioned previously. He only experienced blank awareness with some photographic and cinematic imagery, as is consistent with his meditative stance towards the sessions.

Those who missed the targets on the majority of sessions were S2, S3 and S5. S2 experienced a large number of associations and memories intermixed with blank awareness and photographic images, the occasional intuitive flash and fleeting weak cinematic imagery. S5 also experienced primarily associations and memories and photographic imagery, with only one instance each of wittering, story-telling, blank awareness and body sensations. S3 was more like the psi hitters in that she

experienced primarily photographic and cinematic imagery with a few flashes of all the other states except wittering and story-telling.

Of the "learners", S4 experienced primarily blank awareness with cinematic imagery and strong body sensations, S7 had a wide variety of states of consciousness again heavily weighted on the photographic and cinematic.

I would not really like to conclude anything from such preliminary results, other than to note that they are in line with prior theorising. A tentative hypothesis could be formulated such that those participants who experience states of consciousness similar to S1 and S8 are more likely to be psi-hitters, but this is very vague and I would like to do a lot more in-depth studies first.

Chapter 9.

CONCLUSIONS

In all, four experiments were run over a period of three years. Of these, one was a preliminary experiment to choose suitable stimuli, and three were Ganzfeld experiments in which psi and subliminal stimuli were presented on different sessions in such a way that neither I nor the participant knew which was which. There were a total of 206 sessions, 3 of which were control sessions, with 84 subliminal and 84 psi. Each session lasted just over an hour. Three levels of response were measured: cognitive, emotional and physiological, and various personality tests were administered. The cognitive responses were further judged by independent observers.

1. Target Scoring: Conscious Awareness of the Presence of Target Related Imagery in the Session Mentation.

Table 32 shows the results in brief from the three Ganzfeld experiments, together with the total of all three.

It can be seen that overall the rating of the targets was above chance expectation, and this held for both the psi and the s.p. sessions, with the s.p. performance overall considerably better than the psi.

The Exploratory Study target scoring was overall below chance expectation, with the s.p. slightly more

Participants' Target Scoring

	Exploratory Follow-Up				Final				Total	
	N	Z	N	Z	Series 1 N	Z	Series 2 N	Z	N	Z
Overall	40	-.095	80	+.225	22	+.146	26	-.019	168	+.107
S.p.	20	-.148	40	+.217	10	+.285	14	+.386	84	+.166
Psi	20	-.069	40	+.234	12	-.009	12	-.493	84	+.023

negative than the psi. This negative scoring is attributable to two major factors: inexperience and the use of negative emotional stimuli. Of the session variables studied, the full Ganzfeld sessions exhibited a slightly stronger target scoring than did the partial Ganzfeld sessions, and the positive emotional targets a far greater positive target scoring than either the negative or neutral stimuli. Running two sessions on one day was felt to be counter-productive because of transference from the first to the second session.

The Follow-Up Study was the major experiment in this thesis with a total of 80 experimental sessions and 8 control sessions. The scoring both overall and for the two experimental conditions was significantly above chance. As with the Exploratory Study there was no significant difference between the two conditions insofar as target scoring ability was concerned. In this study there was a high correlation ($r_s = 0.54$) between the participant's

scoring on the two conditions, although owing to the small number of participants this does not reach statistical significance.

In this study only a full Ganzfeld was used, only positive stimuli were utilised and only one session per participant was run per day. Also all the participants and myself were experienced with regard to the procedure. Of the 8 participants, two scored significantly above chance on both the psi and the s.p. sessions, one scored significantly above chance on the s.p. sessions and the remaining five scored at, or just below, chance level, thus exhibiting a wide range of personal ability to choose the target correctly, which was ideal for the various correlations with the psychological factors under study.

The Final Study was run in order to generalise the findings from the previous two to a wider population, and also as a comparison of "naïve" participants with the experienced participants of the previous two studies, i.e., experienced with regard to the Ganzfeld technique, although this is true primarily only for the Follow-Up Study as the participants in the Exploratory Study had not done prior Ganzfeld work.

As can be seen from Table 32, the target scoring once again dropped overall to a chance level, but this time this was due solely to the below chance scoring on the psi sessions, the s.p. sessions being above chance, though not

significantly so. In this experiment Series 2 showed the one and only significant difference between the two experimental conditions in target scoring. It is, therefore, possible that s.p. stimuli are marginally more accessible for "naïve" participants. However, this explanation is confounded by the fact that the significant difference is due primarily to the psi-missing exhibited in this series. The reason for the psi-missing appears to rest primarily with the difficult circumstances under which this experiment was run, and suggests, therefore, that s.p. may be a more robust phenomenon under adverse experimental conditions.⁴

At a qualitative level, i.e., the cognitive response to the targets in terms of the mental imagery, associations, memories, etc. that were elicited during the session, there were no apparent differences between the two phenomena. Perhaps an analyst skilled in analysing primary-process thought patterns might be able to detect a difference, but neither I nor the participants nor the independent judges detected any difference in cognitive style as a result of experimental condition. Both phenomena appear to emerge into consciousness through equivalent psychological processes. Of course, this thesis did not explicitly examine this point, and the Ganzfeld technique determines largely the type of cognition experienced, but there were no obvious distinguishing characteristics between the two phenomena.

The control sessions were run primarily to provide a baseline for the analysis of the physiological and emotional responses to the stimuli. However, they affected the participants in an unexpectedly negative sense, in that these were the only sessions in which feedback was given after the session as to experimental condition (since there was no target sheet to judge). Therefore, consciously or not, in the Follow-Up Study in which there was only one control session to ten experimental, there was a certain relaxation after the control session had been run, ^{but no change in scoring} because the participants knew that all the remaining sessions were experimental. Thus, in the Final Study, Series 2, the control session was turned into a baseline for clairvoyance/precognition since all the sessions, both psi and s.p., were subject to this baseline. Any difference from the control would therefore show the effect of telepathy or s.p. per se. In fact only the s.p. showed a significant difference from the control because below chance scoring was exhibited in this condition as in the psi condition, although not quite so extremely ($z = -.404$). This is an interesting baseline to use, though, and I would definitely use it again.

2. The Independent Judges' Scoring of the Session Mentation

All the session transcripts of the participants' mentation were sent to independent judges in order to determine to what extent the target related information was reported during the session clearly enough for an objective observer to judge the target correctly. The results from this are presented in Table 33.

Table 33
Judges' Scoring of the Session Mentation
(Z-scores)

	N	Exploratory			N	Follow-Up	
		Judge 1	Judge 2	Judge 3		Judge 1	Judge 2
Overall	40	+.189	+.007	-.306	80	+.217	+.053
S.p.	20	+.191	-.113	-.447	40	+.124	+.068
Psi	20	+.187	+.127	-.165	40	+.311	+.038

	N	Final Series1		N	Series2		Total	
		Judge 1	Judge 2		Judge 1	Judge 2	N	Z
Overall	22	+.504	-.043	26	-.027	+.244	168	+.195
S.p.	10	+.370	-.156	14	+.201	+.525	84	+.150
Psi	12	+.760	+.050	12	-.293	-.083	84	+.264

Overall the judges rated the targets considerably more correctly than did the participants themselves, and there is a reversal in that they rated the psi sessions more

accurately than they did the s.p. sessions. As with the participants' target scoring there was never a significant difference in scoring between the two phenomena.

In the Exploratory Study three different types of judge were used. Judge 1 was a psychotherapist with previous experience of subliminal perception research; Judge 2 was a poet; and Judge 3 a psychic. The lesson learnt from this study was that the best type of judge for Ganzfeld research is one who is trained to understand primary-process thought patterns, since Judge 1, the psychotherapist, was the only judge to score consistently above chance. The psychic rated the targets significantly below chance, thus exhibiting psi-missing and perceptual defence, presumably in reaction to the negative emotional targets as had the participants themselves, which suggests that a psychic is not sufficiently detached as an independent observer.

Therefore, in the Follow-Up Study, two psychologists, one of whom had previous experience with Ganzfeld research (Judge 1), were used to judge the session transcripts for correspondence with the targets. Both judges scored the targets above chance expectancy, Judge 1 significantly so, both overall and with the psi sessions.

In the Final Study both judges were psychologists who had had previous experience with the Ganzfeld technique. The results from these two judges were mixed, but then so were those from the participants! Judge 1 rated the

targets significantly above chance in Series 1, and Judge 2 scored significantly above chance in Series 2. Overall their scores are significantly above chance. This was a far higher performance than the participants themselves and so suggests that trained, experienced judges are very valuable observers of participants' mentation.

In all three experiments, the judging of the session mentation transcripts by the independent judges corresponded significantly to the participants own judging of their session mentation, suggesting that the target-related information was objectively present in the session mentation, and that it was this information being used by both the judges and the participants to identify the target.

Once again there was no significant difference overall between the psi and the s.p. sessions, although on two occasions a judge independently scored the psi session transcripts significantly above chance, and on one occasion scored the s.p. session transcripts significantly above chance. This suggests that from an objective viewpoint, the subliminal information did not emerge with any greater clarity than did the psi information.

3. Psychological Tests

3.1. Attitude - to - Psi

Of all the subsidiary tests surrounding the primary response measure of attempting to determine the target on the basis of imagery experienced whilst in the Ganzfeld, the most consistent predictor of subsequent scoring level was that of attitude-to-psi, as shown in Table 34.

Table 34

Attitude-to-Psi Correlated with Target Scoring

	Exploratory		Follow-Up		Final		Total	
	N	r	N	r	N	r	N	r
Overall	10	+.420	8	+.623	29	+.370	47	+.429
S.p.	10	+.585	8	+.655	29	+.415	47	+.513
Psi	10	-.173	8	+.357	29	+.228	47	+.148

Whether one believed in psi per se, in one's ability to become aware of psi phenomena, had had past experience of psi phenomena, and was confident that one would become aware of the psi-related information in the experiment, correlated significantly with the overall scoring and with the s.p. scoring in all three experiments. The correlation with the psi scoring was weak but overall in the same direction. The most interesting aspect here is that

a test designed to be predictive of psi scoring, emerges as being so strongly predictive of subliminal scoring levels. It seems as if our attitudes affect our ability to be aware of low-level stimuli in the environment other than the psychic.

3.2. Ås Openness-to-Experience Inventory

The Ås Inventory was designed to discover those people who would be most susceptible to hypnosis, and covers nine personality dimensions such as experience of altered states and peak experiences, tolerance of regression, dissociation, attitude to the unusual, and interpersonal trust. This Inventory was given to every one in the Exploratory and Follow-Up Studies, and to a small number of participants in the Final Study, the results being shown in Tables 35 and 36.

In all three experiments this inventory correlated significantly positively with the attitude questionnaire. This suggests that those people who are likely to be susceptible to hypnotic induction procedures are those who have had experience of, and believe in the reality of, psi phenomena. In other words, both questionnaires are tapping a related aspect in the participants - namely openness to, and willingness to experience, states of consciousness other than the normal, logical, linear mode of our everyday

Table 35

Correlation between Attitude and the Ås Inventory

Exploratory			Follow-Up			Final			Total	
N	r	p	N	r	p	N	r	p	N	r
10	+.720	.018	8	+.903	.001	16	+.570	.025	34	+.692

Table 36

Correlation between the Ås Inventory and Target Scoring

Exploratory			Follow-Up		Final		Total	
	N	r	N	r	N	r	N	r
Overall	10	+.331	8	+.295	16	+.304	34	+.309
S.p.	10	+.294	8	+.380	14	+.043	32	+.206
Psi	10	+.046	8	+.099	13	+.276	31	+.157

waking selves.

The Ås questionnaire also consistently correlated positively with the target scoring in all three experiments, but never at a significant level, possibly owing to the small number of participants. This could be an inherently weaker correlation than the attitude one as the Ås Inventory covers a number of dimensions.

3.3.Other Psychological Tests

Of all the other tests done, only the Witkin Embedded Figures Test was used in more than one experiment,

and this did not yield consistent results. None of the other tests of imagery, cognitive flexibility, "hemisphericity" or ways of thinking, gave clear results as to their possible relation to scoring ability on the target judging task.

4. Physiological Response

Throughout every session in every experiment, a continuous Galvanic Skin Response chart was recorded. This was later analysed to see if the participant had responded to the psi or subliminal stimulus with a change in skin resistance. The results were surprisingly mixed and inconclusive as shown in Table 37.

Table 37

Galvanic Skin Response at Stimulus Onset (μ mho)

	Exploratory Follow-Up				Final				Total	
	N	Trend	N	Trend	Series1 N	Trend	Series2 N	Trend	N	Trend
S.p.	10	+14.60	8	- 2.20	9	+ 2.81	13	+20.89	40	+10.63
Psi	10	+ 4.55	8	+10.60	11	+ 9.13	9	- 0.58	38	+ 5.94
Control	10	+ 1.08	8	-26.1			9	+ 0.09	27	- 7.30

On two occasions the s.p. stimuli appear to produce the strongest physiological response, and on two occasions the psi stimulus times appear to be related to the strongest physiological response. Overall, however, the s.p. stimuli

do show the clearest physiological response as was expected, but I cannot draw any firm conclusions from these results.

This is very surprising because a physiological response is a standard method for assessing reactions to a subliminal stimulus. It could well be that in most s.p. experiments negative emotional stimuli are used and these, as in the Exploratory Study, do produce significant physiological responses, whereas the pleasant stimuli used in the Follow-Up Study produce a less clear response - as is typically the case with psi phenomena.

5. Subsidiary Psychological Tests

As well as assessing cognitive, personality and physiological variables relating to the person's awareness of, or response to, the target, a variety of subsidiary measures relating to the experiment were explored.

5.1. The Mood Report

On entering the session chamber and directly after the Ganzfeld, all participants always completed a Mood Adjective Check List, thus giving some indication as to the type of mood with which they came to the session, and their shift in mood over the session. The 50 mood adjectives were factor analysed and sorted into five descriptive groups, and the resulting scores were then analysed to determine the effect of the experimental session on mood, as shown in Table 38.

Table 38

Effect of Experimental Condition on Mood Shift

	Exploratory			Follow-Up			Final		
	S.p.	Psi	Cont.	S.p.	Psi	Cont.	S.p.	Psi	Cont.
Group 1	-14.5	+5.0	-2.0	-17.1	- 9.6	-57	-29	-46	-33
Group 2	- 6.5	+3.6	-4.4	-14.7	-19.8	-54	- 2	-27	-14
Group 3	+11.5	+1.1	+1.8	+21.6	+26.8	+23	+ 9	+38	+17
Group 4	+ 0.3	-3.2	-2.7	- 0.3	+ 0.3	-13	-14	- 2	- 4
Group 5	+ 9.3	-6.3	+7.0	+10.8	+11.8	+13	0	+15	+ 9

All the experimental conditions follow roughly the same pattern with a decrease over the session in the general positive group 1, and "anticipatory" positive group 2 and the general negative group 4, and an increase in the positive "drowsy" group 3 and the more negative "tired" group 5. A significant Anova interaction emerged in the Final Study with the psi sessions being related to far more extreme shifts in mood, but this significance is questionable since neither of the factors were independently significant.

When the data were analysed with regard to whether or not the participant scored the target above or below chance (hit or missed the target), the shifts in mood as depicted in Table 39 emerge.

Table 39
Shift in Mood Related to Target Score

	Exploratory		Follow-Up		Final	
	Hit	Miss	Hit	Miss	Hit	Miss
Group 1	+ 5.7	-11.5	-23.8	- 1.7	-33.6	-16.9
Group 2	+ 0.8	- 3.9	-17.5	-23.5	-12.0	-18.5
Group 3	+ 6.6	+ 5.5	+32.1	+ 3.2	+35.6	+31.0
Group 4	- 7.8	+ 0.9	- 1.1	+ 7.3	-14.4	- 4.6
Group 5	- 5.1	+ 9.0	+ 7.7	+12.6	- 2.8	+15.3

There was a significant difference in shift in mood on both the experiments in which an Anova was performed - the Follow-Up and Final Studies. All three experiments show a similar pattern in shift in mood over the session related to whether or not the person subsequently judged the target correctly. All show that hit sessions, i.e., those with a positive z-score, are related to a larger shift in the "drowsy" Ganzfeld-induced state of consciousness (Group 3), to a smaller rise or even a decrease in negative mood states (Groups 4 and 5), to a smaller drop in the anticipatory, excited mood group, and to a larger drop in Group 1 (which actually suggests that they came to the session in a better mood than when they missed the target).

Since the mood reports were completed prior to the judging of the target pool, this shift in mood was prior to

any conscious knowledge of the content of the target pool and so prior to the actual hitting or missing of the target. Did the person, therefore, subsequently miss the target because they were in a bad mood, or did they shift into a bad mood over the session because they were defending against the target, or because in some sense they "knew" that they were not reporting target related imagery? Similarly, did they hit the target because they were in a good mood, or did they shift into a deeper altered state of consciousness and feel more positive because in some way they "knew" that they were reporting target related imagery and felt good about it?

5.2. Additional Tests

Participants also completed word association tests on all the words in the target pool just after completing the mood report and prior to the judging procedure, in both the Follow-Up Study and Series 2 of the Final Study. On neither occasion did the word association reaction time bear any relation to whether or not the person subsequently hit the target. Related to this test was a subsequent semantic differential test using the target word, the word associate, a temporally related image from the session mentation and a control word. This yielded no conclusive results.

The participants also completed a state of

consciousness report which we devised as a group. This yielded some potentially interesting material, but never reached beyond the purely exploratory stage.

6. Concluding Remarks

These experiments forced me into a conclusion that I have to admit I did not expect; namely, that the psychological processes by which we can, under certain circumstances, become aware of psi information are the same as those by which we can become aware of subliminal stimuli which are below the awareness threshold, and therefore, by definition, stimuli of which we are not conscious at the time of stimulation, but which can be brought to awareness through reverie, dreaming etc. Both phenomena of necessity utilise primary process thought patterns accentuated here because of the Ganzfeld; both are personality dependent, some people being able to pick up on the target related material all the time whilst others fluctuate around the chance level, and still others defend against the information and so score below chance levels.

Both phenomena occasionally give a physiological response to the stimulus, but in a situation such as the Ganzfeld where there is a lot of internal and external "noise", this type of stimulus related response seems to be less clear. This lack of clarity is also possibly related to the use of pleasant targets.

Both phenomena seem to be related to a similar shift in mood over the session, the only noticeable difference in mood shift being related to whether or not the person hit the target. Thus, there seem to be no clear distinguishing characteristics differentiating the two phenomena at any level of response.

In the literature review it was suggested that subliminal perception would be amenable to the Ganzfeld technique, and this indeed seems to be the case, results very similar to those achieved in the Poetzl Effect occurring. My experiments in no way contradict findings in subliminal perception research, nor do they contradict findings in parapsychological research. What they do is bridge these two disciplines and emphasise the incredible similarity in the behavioural effects of the two phenomena when using the Ganzfeld technique.

This thesis has been a deep learning experience for me in many ways, only some of which are presented here. When I started I was totally ignorant of the psychic world and of those people who involve themselves with it. Over the past ten years I have met parapsychologists from many different countries, occultists of every shade and description, psychic sensitives, spiritual devotees of an almost bewildering variety, astral projectors, and so on. With all but parapsychology I have been a cautious onlooker, hoping to learn something more about the question that I have been

presenting here, which is more really than a comparison of subliminal and psi perception, being a study of one aspect of consciousness - how we become aware of "low-level" stimuli.

But, over the past ten years, I have not only met a wide variety of people about whom I had no knowledge previously, I have also been introduced to an even wider variety of literature, ranging from quantum mechanics to philosophy, taking in neurochemistry, neurophysiology, anthropology, botany, statistics and many other more esoteric subjects on the way.

Thus, the whole content of this thesis must be understood in terms of this "developmental" approach. Those participants who worked with me for so many years felt that for them it was a chance to learn more about the way in which their minds worked. One psychotherapist who came in for just one session remarked enthusiastically at the end of the session that it was the best growth therapy technique that he had come across. Those people who got bored, or had cognitive dissonance or any other problems which prevented them from enjoying the sessions as a positive learning experience stopped scoring well. When I was setting up each experiment I would always run a couple of sessions with myself as participant first. My scoring prior to the Exploratory Study was below chance, my scoring prior to the Follow-Up Study was above chance - I grew, I learnt, I

became more aware.

Perhaps the major conclusion of the whole thesis is this similarity between subliminal perception and psi awareness, that both involve the person adopting a state of mind that permits them to become aware of thought processes which the normal hurdy-gurdy of life prevents most people having any knowledge of. The process of becoming aware of both forms of information appears to be very, very similar indeed. Whether we look at the awareness level in terms of target choice, or emotional response, or physiological response; whether we look at attitude, personality or other psychological correlates of the target scoring, there is no fundamental difference between the two phenomena at the response side of the process. People who are capable of becoming aware of the effect of one form of stimulation are similarly sensitive to the other - and there are some people who are not sensitive to either - at a consciously recognised level anyway, although there are definite signs that the target related information pervades nearly every single session transcript no matter who, it merely being more obvious in some.

APPENDICES

Appendix 1: Word Rating Scale

Name:

Date:

Pleasant

Unpleasant

1) Phantom

1 2 3 4 5 6 7

2) Caress

3) Cosmic

4) Hornet

5) Comet

6) Despot

7) Python

8) Fascist

9) Feline

10) Cobweb

11) Nightmare

12) Whisky

13) Stagnant

14) Threshold

15) Circus

16) Cowboy

17) Fondle

18) Lagoon

19) Inject

20) Vermin

21) Tranquil

22) Dancer

23) Cocoon

24) Satan

25) Outcast

26) Gypsy

27) Dagger

28) Coffin

29) Carnage

30) Mellow

31) Spacious

32) Suckle

33) Starlight

34) Cancer

35) Cripple

36) Magic

37) Bondage

38) Vomit

39) Dentist

40) Hangman

Appendix 1, cont.

	Pleasant					Unpleasant	
	1	2	3	4	5	6	7
41)Maggot							
42)Panther							
43)Goblin							
44)Spider							
45)Foxy							
46)Demon							
47)Sapphire							
48)Vulture							
49)Bonfire							
50)Snuggle							
51)Kidnap							
52)Talon							

Appendix 2: Exploratory Study Sample Target Pool

Word Ratings

Name:

Date:

Could you please rate each group of words on the scale according to your degree of certainty that they were or were not presented. If you are absolutely certain that they were presented, give a rating of 1, if you think that they might have been give 2 or 3, if you think that they weren't give 4 or 5, and if you are absolutely certain that they weren't, give a rating of 6.

i.e.	1 YES!	2 YES?	3 YES??	4 NO??	5 NO?	6 NO!
Spacious						
Starlight						
Cosmic						
Magic						
Transcend						
Stencil						
Alcove						
Feline						
Comma						
Octave						
Frigid						
Cripple						
Sterile						
Failure						
Spastic						
Spider						
Vampire						
Hornet						
Lousy						
Maggot						
Snuggle						
Slumber						
Refuge						
Suckle						
Cradle						

Appendix 3: Follow-Up Study Sample Target Pool

POOL 2

Name:

Date:

Please rank order the 4 groups, giving the letter A to that group that you think was presented, down to a D for the group that you think is least likely to have been. Also rate on the same basis.

	GROUP	RANK	RATING
	Mermaid		
	Seashore		
1	Ocean }		
	Oyster	No	Yes
	Seashell		
	Theatre		
	Shakespeare		
2	Hamlet }		
	Tragedy	No	Yes
	Drama		
	Journey		
	Train		
3	Whistle }		
	Railroad	No	Yes
	Station		
	Bumblebee		
	Honeycomb		
4	Hive }		
	Nectar	No	Yes
	Clover		

Appendix 4: Participants' Mentation Style

The following examples are taken from the first fifteen minutes or so of the person's session, and are not edited in any way. They are merely examples of the typical thought patterns of each individual and have been chosen with that in mind, rather than as examples of outstanding hits. Those images which do have relevance to the target words have been emphasised so as to more clearly elucidate the different types of thought through which the target emerges.

When compiling the examples I have taken care to include equal numbers of each condition, and of hits and misses; thus there are two subliminal hits and two subliminal misses; two psi hits and two psi misses. This will give an overall view of the ways in which the hit and miss sessions differ in some respects, and in other ways are similar, e.g., "noise" and defences. One point of interest to note is the frequency with which the target related material emerges before the first word on the tape.

Sl. Session 10. Pool 9 Theme 3. Psi. Rank 1 Hit.

Target words: Gypsy, Tinker, Caravan, Glade, Campfire.

"I see a picture of Saturn - - - which turns into a buzz saw - circular, no it's circular; circular saw - and um - starts slicing water - sea water - (yawn) - **arbour** - oak - (pause) - **uh, green man, forestal** - - **green man, green man** - - eating a banana - - - turned into a - - demon - - demon drawing - still eating a banana - (pause) - water; drilling water - drilling a lot of water;

1st.word on tape: "interesting to see how the water churns up around this motion - - - micro thread; no a - a buzz saw again - - thin, it passes between the molecules - - - man with wings - (pause) - big sheet - metal - tank - water tank

2nd. word: - - "See a black spot in it, prass - p'raps an air hole, breathe hole, something like that - - - parachute - - man-thing on parachute; parachute on thing - spinning very fast as it comes down - around its vertical axis - - turns into a balloon - - -

3rd.word: "Filled with bricks - - falling quite fast - - - - - into the sun - got a funny face, the sun - (yawn) - bit like the man in the moon, like you see in kiddies books - oh, it's the face of the sun though - (yawn, cough) - - **link - link - link in a chain**

4th.word: "Like in a bicycle chain - round at the ends, long - but it's black and it stands alone - it looks like

the link in a bicycle chain, but it's a lot bigger - - - and it's got grooves in it's outer edges, and a groove going round it's circumference, um - - -conker - radia? conker - I see a conker shell - spiky shell - - -

5th.word: "A house; but it's on wagon wheels - and it's got a chimney -b - but more like the chimney of an old style ss- - steam engine; racing along very fast - - - ah - now it's in the desert, there are men wearily pulling it up this huge sand dune - -

6th.word: "Grass bricks - - that's how they can pull it, the house is built of grass bricks - - and another made of plywood - - - ludicrous - - - a whistle, a dog's whistle - what am I doing with a dog whistle; nothing, just lying there - just came to mind - -."

S2. Session 3. Pool 6 Theme 4. S.p. Rank 4 Miss.

Target words: Smugglers, Contraband, Adventure, Horses, Moonlight.

"I almost fell asleep it was so relaxing then. I'm letting my mind wander now - - - I saw a black stallion - (pause) - I'm adjusting my posture for the moment - (pause) - OK, I got a whole string of images there - I was inside a prison and I could see the inmates behind the bars, and looking at their faces, they were all boys - (pause) - the effects of amphetamines on rats; I was seeing some of the

symptoms - - - it's all associates - again I'm trying not to
associate - from rats I went to people, and from people I
went to institutionalised people - thinking of the problem
that uh - the effects of amphetamine are rather like those
produced by schizophrenia - - - I saw Superman then - -
-mmm OK Batman, Flashman, DC Comics, the whole trip - - -
mmm - - again Bizarro World which is also part of the DC
Comics scene; everything is twisted around and upside down;
I think I am just associating again with abnormality -
(pause) - a single tree sitting in the middle of a field -
some blackbirds at the bottom of it pecking around some dust
- yes, the whole tree's got dust covering it instead of
leaves - - - - a vacuum cleaner - - - - not making any
difference to the tree - it's still covered in dust -
(pause) - mmm, I'm thinking of Dr. Who and the Tardis now -
- - - cigarettes - (pause) - London Transport and why
people ignore the signs on the front of the bus upstairs -
(pause) - the Pyramid of Giza - or a pyramid, but the name
Giza suddenly came to me so - I said that - - - - coming to
a perfect point, it's superbly crystalline, a supersmooth -
surface not like the real pyramids, pointing to a hole in
space - - - mmm, I can see lots of ss - Hieronymus Bosch
characters dropping in and out through the hole - - - ???
it to be a hole in someone's body, I suppose - - - I'm
seeing lots of horrible surreal images just now - - strange
monsters - - - I quickly change and the name Steerpike -

that's S-T-E-E-R-P-I-K-E from Mervyn Peake's trilogy
"Gormenghast" - I can see him holding a knife in his hand -
- -

1st.word.: "Mmm - knives remind me of Clint Eastwood:

"Play Misty for me" - (pause) -

2nd.word: "Yellow curtains - (long pause) -

3rd.word: (pause) -

4th.word: "Just getting nothing at all at the moment - -
the word iceberg keeps - -."

S3. Session 8. Pool 6 Theme 1. Psi. Rank 3 Miss.

Target words: Jungle, Elephant, Alligator, Tiger, Swamp.

"The first picture I got, which was a little while ago, was to do with tape recorders; seeing the deck of a tape recorder and then one of those door - screen things made up of strings of ribbon - from that I got a - streamers of bunting and flags - like you get at a garden fête, but looking upwards - something to do with a festival and a crowd of people - some kind of summer time celebration - - - -

1st.word: "Sounds as if there are birds singing on the tape - (pause) - looking up at the sky and some tree tops, but still streamers and flags and things - red and yellow or white against a blue sky - (pause) -

2nd.word: "(Pause) - seems to be another spacious feeling

with more blue sky and a mountain top - bit of snow - - -
- and now a desert(!) scene with some cactus - - the
mountains seem to be in the distance still - -

3rd.word: "(Pause) - now a pair of cowboy boots of tooled
leather - - - and an American saddle horse with - a big -
cowboy saddle - a black and white horse - - - and some Red
Indians - and a tipi, putting up a tipi with - paintings on
it - - -

4th.word: "The waterfall tape's just gone funny - - - I
think the tapes jumped out of it's groove - (pause) - still
the birdsong even though the tapes gone funny, and still
this bunch of Red Indians out in the middle of the desert -
they seem to be debating where to make their campsite - - -

5th.word: "Somebody's lit a fire - now that's got the
water back - (pause) -

6th.word: "Yeah, the Indians are having a dance for rain
I think - - they've made a circle of small poles - - - - -
or - maybe bars of cactus; something about 2 foot high in a
ring - a circle about 20 feet across - - ."

S4. Session 7. Pool 10 Theme 3. Psi Rank 2 Hit.

Target words: Falcon, Talon, Hawk, Swoop, Prey.

"Well, I think the first word must be Ajax liquid, Serena, because I can see little white tornadoes - zipping around - - - - I often get very - I often get circular moving - objects when I do this; I think it might just be uh - -

1st.word: "Well I think it might be irrelevant really - - - - not easy to make sense out of everything I think or feel or think I see - - - 'cos often it looks like it's going to turn into something or be something and then it - just disappears round the edges - - - -

2nd.word: "But the red haze is certainly very active - lots of things shooting about which y'know - straight lines - tornadoes like I said - streaks, flashes - - - there's something that looks like either my initial - A - or an artists easel frame - one of those blackboard framestands that you prop blackboards up against - -

3rd.word: "(Pause) - - and an M as well - like a MacDonalds M - A - N - A - M - - - I'm certainly getting letters - E, and E shape - - - - another A - - sort of fan, like a windscreen wiper - yeah - - -

4th.word: "(Pause) - whenever I do these sessions I always have the faint hope that in front of my eyes will suddenly appear whatever it is - in glorious living technicolour - I

don't suppose it's as easy as that - -

5th.word: "I've got angles again - like y'know you've been in a room - the angle of the floor - and the wall - - (pause) -

6th.word: "(Pause) - I think I must be near the sea or on the ocean - I'm sure I just saw a whale float past - or the water is heaving or maybe it's in a tank - or a zoo, because there isn't any great expanse of space - -."

S5. Session 7. Pool 10 Theme 4. Psi. Rank 3 Miss.

Target words: Baby, Bottle, Cradle, Nursery, Rattle.

"My mood has become very down - sort of disheartened - - depressed - - - - but I will soldier on anyway, um - - - - the word "waste" - or "western" came to mind - - that reminds me of "The Wasteland" by T.S.Elliot - - - the word "macintosh" comes to mind - - - - and that old favourite "Restless Farewell" - - J.B.Rhine dies - - - I heard something sounded like alarm bells - like a fire alarm - - - I think of the word "wanderers" - there's a movie about that - I think it's about '50's youth - - - Rudolph the Red-nose Reindeer - - had a very shiny nose - - -

1st.word: "I'm scratching my ear right now, that's why I'm shaky - - um - - my mind seems awfully blank - - "Pay your dues - you've got to pay your dues, to sing the blues"

2nd.word: "(Pause) - I thought of the word "sensual" and

then "Fantastic Five" - it's the "Fantastic Four" though,
isn't it - it's the uh - um - something five - fearless? -
or huh - - - Dr. Doolittle comes to mind - -

3rd.word: "He can talk to animals - he had a pet monkey -
- - - a lot of his animals had double names like "Quack,
quack" - and he set up an animal bank - - - I think of a
photo I have with one monkey feeding another - - - the
word "suspense" comes to mind - - -

4th.word: "That reminds me somehow of Alfred Hitchcock - -
and then "The Twilight Zone" - - - I've been having a lot of
dreams lately about the underworld - - -

5th.word: "Shades - - - quite frightening dreams really -
- - the word "Cincinatti Kid" comes to mind - playing
poker or playing pool - - - Minnesota fags - - ."

S6. Session 1. Pool 3 Theme 2. S.p. Rank 1 Hit.

Target words: Watermill, Stream, Corn, Flour, Grindstone.

"String - (pause) - a house - (pause) - purple -
(pause) - the sun - (pause) - a hand - (pause) - heart -
(pause) - a door - (pause) - warmth and love - (pause)

1st.word: "(Pause) - streams of light like from the sun -
(pause) -

2nd.word: "(Pause) - a fork - (pause) -

3rd.word: "Out in the country - - - rolling hills - - going
for a walk - (pause)

4th.word: "(pause) - a kangaroo - (pause until -
7th.word: "(Pause) - kangaroo again - (pause)
8th.word: "(Pause) - a waterfall - - - a - aurora borealis
- (pause until -
10th.word: "(Pause) - the sun - (pause) - a triangle -
(pause)
11th.word: "(Pause) - the horizon - (pause)
12th.word: "An egg - (pause) - I was just getting very
sleepy - (pause until -
14th.word: "Checker board pattern - - - a bat - it's the
flying kind - (pause) another triangle -
15th.word: "Trees - (pause)." END.

S7. Session 6. Pool 3 Theme 3. S.p. Rank 3 Miss.

Target words: Christmas, Festivity, Winter, Solstice,
Rebirth.

"I thought of a church, a cathedral - - inside a
cathedral, the light coming through the stained glass
window; blue light; blue and red windows - - - dark inside
with the sunlight coming through - (pause) - I thought of
a pencil box - and a ruler - - - - and then of a badge; but
no particular badge, just a badge - the sort - a pin that a
kid puts on - - - - a schoolroom - (pause, yawn, moves) - -
I thought of some knitting needles and knitting - - with red
wool, I think - (pause) - a tube of toothpaste - (pause,

clears throat, moves) - something swirling, something like a whirlwind - a screw - sort of turning down the screw thread - - things swirling round and down - - - a watermill and then a waterfall - - - water going out the plug hole of the bath - - - a field with some woods at the edge - nothing in the field - - - there's somebody walking down a country lane whistling - I'm not really aware of the person, just the whistling - - - and they've got a bit of straw in their mouth, or a bit of grass - - -

1st.word: "(Pause) - a terrapin - looking out of the water and swimming along - crocodiles - (pause, yawn, move) - and racing cars going round a race track - it's a sort of bright sunny day - it's a dusty race track; there's dust being blown up - - -

2nd.word: "And a checkered flag - - - I thought of a stripper and a strip show - - and a bottle on a table; bottle of drink - - - and a windmill; tulips - - -

3rd.word: "(Pause) - a railway line leading somewhere - - - down a road, or a lane, with a white fence - - hills in the background; clouds over them - - -

4th.word: "(Pause) - being taken up a hill - to look at something - - - looking down at people living their lives - - - little houses in - around - - - and the sun in the distance; blazing hot - -."

S8. Session 2. Pool 10 Theme 2. S.p. Rank 2 Hit.

Target words: Sultan, Harem, Aladdin, Feasting, Dancing.

"Well, I fell asleep there - but then I'm awake now and I'm practising Yoga Nidhra and trying to find the word - - back to the womb - what do I see in this womb - shapes, can't make out - gone straight into - shit - myself or something - - - concentrate - going through something - why always going through something - - amazing light - - see nothing - only going through these things - with incredible speed - ? ? ? ? ? ? ? - seeing something, don't know what it is - - crib or something - cradle, I mean, definitely a cradle in a sitting room - Middle Ages - sitting room - somebody rocking this cradle - dressed in Middle Ages clothes - tapestry in the back - mineral - either coal or some kind of stone, mineral - - - dreaming away - - definitely a mineral, changing to pool - or something - - - flashes of light - - - planet - - - shapes so obscure it takes some time before you see - - - nice wander - - - houses - - - see - stupid me - looking out of window in this lab. over townscape instead of - - - - beansprouts - -kitchen - copper utensils - - clock - - - carpenter's workshop - - - with all these tools hanging on wall in corner arranged nicely in shape and things - - carpenter's workshop and not a forge - still carpenter's workshop - - - do I have a - - - lot of - kitchen again and stoves -

something with tools - - - houses - - Georgian houses - - -
people dressed in 16th century clothes - -

1st.word: "House doesn't fit with people and clothes - -
houses conform to period of clothes - - - Dutch, Golden Age
painters - - kitchen, 16th century kitchen - - Von Ryer?
painting, somebody peeling mussels - - -

2nd.word: "What do I see now - wish I could see shapes -
before I have to stare, stare, stare - - - vegetable stalls,
vegetable, fish stalls, something - big pebbles - scales
- shell fish, I mean - market - - -

3rd.word: "Preoccupied with food today - kitchen, market
stalls - - houses - - ."

Appendix 5: Exploratory Study Mood Report

Name:
Date:

Session:

Could you please tick those words that best describe what sort of mood you are in at the moment. If there are any words not present that you feel are particularly applicable to you, feel free to add them in.

Drowsy
Angry
Bored
Lackadaisical
Friendly
Forceful
Dreamy
Adventurous
Tired
Genial
Relaxed
Childish
Erotic
Dissatisfied
Languid
Decisive
Energetic
Defensive
Happy
Uncomfortable
Serious
Dull
Hesitant
Satisfied
Silly

Cheerful
Light-headed
Assertive
Tense
Depressed
Comfortable
Disinterested
Threatened
Warm-hearted
Fearless
Withdrawn
Lazy
Indifferent
Sad
Excited
Hypersensitive
Quiet
Interested
Elated
Jumpy
Confused
Sensual
Retiring
Amiable
Drifting

Appendix 6: Follow-Up Study Mood Report

Name:
Date:

Session:

Could you please tick those words that best describe what sort of mood you are in at the moment, giving an intensity rating of 1 - 4, where 1 means that you only feel like that a little bit, through to 4 meaning that you feel the mood very intensely. If there are any words not present that you feel are particularly applicable to you, please add them in.

Drowsy
Aggressive
Bored
Detached
Friendly
Speedy
Dreamy
Adventurous
Tired
Unsure
Relaxed
Childlike
Alert
Dissatisfied
Lethargic
Decisive
Energetic
Defensive
Happy
Uncomfortable
Serious
Disappointed
Oppressed
Satisfied
Comfortable

Annoyed
Cheerful
Light-headed
Assertive
Tense
Depressed
Irritable
Threatened
Warm-hearted
Carefree
Withdrawn
Reposed
Useless
Sad
Excited
Anticipatory
Quiet
Interested
Intense
Jumpy
Confused
Sensual
Introspective
Amiable
Drifting

Appendix 7: Sample Word Association Sheet

POOL 2 - WORD ASSOCIATES

Name:

Date:

Session:

WORD

ASSOCIATION

TIME

Bumblebee

Oyster

Honeycomb

Shakespeare

Seashell

Mermaid

Ocean

Tragedy

Seashore

Nectar

Drama

Journey

Theatre

Whistle

Hive

Hamlet

Railroad

Clover

Station

Train

Appendix 8: Follow-Up Study State Report

Name:
Date:
Session:

Could you please tick those words that best describe the type(s) of thought that you experienced during the session, indicating the amount of time for which they were experienced on a 1 - 4 scale, where 1 indicates that that type was experienced only briefly, through to 4 indicating that you experienced it for a lot of time. Also, if you did experience several types of thought, could you try to indicate the order in which they came by using letters, i.e. "A" is that type experienced first, "B" second, and so on. If there are any words not present that you feel are particularly applicable to you, feel free to add them in:

ORDER	DURATION	STATE OF CONSCIOUSNESS
_____		WITTING: non-stop chattering.
_____		DIALOGUE: 2 or more me's discussing.
_____		PHOTOGRAPHIC: one thought followed by another in disjointed sequence.
_____		ASSOCIATIVE: one thought leading to another.
_____		MEMORY: remembered events.
_____		CINEMATIC: vivid dramatic imagery - often totally autonomous.
_____		STORY-TELLING: controlled drama.
_____		BLANK AWARENESS:
_____		INTUITIONAL: more a feeling than a thought.
_____		BODY-SENSATIONS: e.g. floating, oppression, doesn't exist, OOBIE, etc.
_____		ANY OTHER:

Next, could you please indicate on the following dimensions, how those types of thought that you experienced actually felt. If there is any dimension inapplicable to a particular type of thought then just leave it out, otherwise try to show how the various types of thought differ from each other:

FOR EXAMPLE:

WEAK	Witter.		Photo.			Cinem.	VIVID
	1	2	3	4	5	6	

BITTY CONTROLLED DETACHED VERBAL VIVID EMOTIONAL INWARD

1							
2							
3							
4							
5							
6							

CONTIN. SPONT. INVOLVED PICTORIAL WEAK UNEMOT. OUTWARD

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NOTES

1. I specifically chose not to study the relationship between sender and participant in this thesis, though the data are available for a retrospective analysis. This put the onus of hitting the target solely onto the participant.

Of interest in the Follow-Up Study, however, is the fact that only one participant consistently brought in his own sender - and he scored below chance overall!! The three significantly above chance target hitters all left the task of obtaining a sender to me and, as I relied on volunteers in this experiment, there were a large number of different senders, most of them students at the university.

2. Precautions against fraud were present in the design, but there was no great emphasis placed on this aspect of parapsychological experimentation, as I was learning all aspects of the Ganzfeld technique, experimental design, statistics, etc.

However, certain basic fraud prevention aspects were incorporated into the experiments:

a) The sender was placed two rooms apart from the participant, the lab. technician's room and the experimenter being situated between the two.

b) In the Follow-Up and Final Studies there were a large variety of senders, many of them strangers both to me and to

the participants.

c) All instructions had been prepared by an independent (and sceptical) person beforehand and sealed in envelopes which were kept in the lab. technician's drawer until time for use. The technician himself gave the sender the appropriate envelope.

3. Ever since the pioneering work by Rosenthal (1966) on experimenter effects, psychologists have been only too aware of the psychological effects an experimenter can have on the outcome of an experiment. For this reason most experiments are now designed as double-blind studies. However, psi in potential is immune to such safeguards as, theoretically, experimenter and participant can be aware of everything in connection with the experiment. The only sane course for the experimenter to take in the light of these theoretical considerations is to adopt as detached and neutral an attitude as possible with regard to the outcome of the experiment, whilst being aware of any potential source of influence.

Apart from psi influences there are also psychological ones. A "psi-conductive experimenter" is already a subject for research in their own right! I worked right from the start at learning how to be a psi-conductive experimenter since I was interested to find at least some evidence of psi in my research to compare with the s.p. In

doing so I came across the inevitable personality problems, in that I was more at ease with some of the participants than with others and this alone could possibly "explain" the individual differences and patterns of scoring.

If so, it is only a partial explanation as the participants' target scores do correlate with the attitude and personality questionnaires which they completed prior to the sessions.

4. With regard to the degree of target randomisation achieved, and the possibility of "skew", I examined the numbers of times each tape within each pool was chosen in the Exploratory Study. Each pool was used ten times, once for each participant. There were 5 target tapes in each pool, so there should be a mean of two times that each tape would be used. The actual number of times each tape was used are shown in Table 40. I have also noted whether or not there was a hit on that tape.

From Table 40 we can see that two tapes were not used at all, and one tape was used four times; six were used three times each; seven twice each and four once, which seems to be a fairly normal distribution. The pattern of hits and misses on the different themes seems to be similarly distributed.

Table 40
FREQUENCY OF USE OF EACH TARGET TAPE

Theme	Pool			
	1	2	3	4
1	3 - hits	2 - hits	2 - hits 1 - miss	unused
2	2 - miss	3 - miss	1 - miss	1 - miss 1 - hit
3	1 - miss	unused	2 - miss 1 - hit	4 - miss
4	2 - hits 1 - miss	2 - hits	1 - miss	1 - hit 1 - miss
5	1 - miss	1 - hit 2 - miss	1 - hit	1 - hit 1 - miss